MATERIALS AND METHODS IN THE MIDDLE GRADES

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MATERIALS AND METHODS IN THE MIDDLE GRADES

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BY

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PREFACE

The first serious efforts made to adapt materials and methods to the mental ages of pupils in the United States were directed to the primary grades. The introduction of the sentence method in reading, the development of number relationships in connection with concrete situations, and the use of simple forms of letters and more suitable materials in writing began to appear in the latter half of the last century. More attractive books, better suited to the needs of young children, were made available. Teacher-training institutions provided courses dealing especially with materials and methods for primary pupils. The salaries of primary teachers were frequently raised above those of the other teachers in the elementary schools. These movements taken together contributed greatly to the improvement of teaching in the primary grades.

Toward the end of the century the colleges became deeply interested in the work of the high schools. College teachers not only wrote textbooks for the secondary schools but also visited high-school classes to see that the subject materials were administered in accordance with the methods proposed. Since the high-school teachers had little opportunity for special training in methods they usually followed those used by their former college instructors. Somewhat later, courses in the teaching of high-school subjects became prevalent. These courses soon aroused a genuine interest in a better adaptation of materials and methods to the needs and interests of adolescent pupils. New interpretations of the aims of secondary education greatly stimulated improvement in high-school instruction. Moreover, since the remuneration of high-school teachers usually exceeded that of the teachers in the elementary schools, there was a strong tendency for the better-prepared and more ambitious teachers in the elementary grades to move into the high schools. As a result of these developments materials and methods in the high-school grades were much improved.

But while attention was being concentrated on the primary grades, the bottom of the system, and while instruction was being improved in the high schools, the top of the system, the middle grades continued to use dead materials and inefficient methods. In order to remedy these conditions the junior high school was organized; and, although the new organization seems to be justifying itself so far as its own field is concerned, it bids fair, with its higher salaries and more attractive working conditions, to draw off from the fourth, fifth, and sixth grades their more efficient teachers.

Although the author is a strong supporter of the junior high school he would not omit improvement in the grades immediately below it, and so he presents this book, dealing with grades four to nine inclusive, with the hope that it may be of service to those who are working with that part of the school population approximately nine to fifteen years of age. The book is intended for use by teachers in service as well as by those in preliminary training; it may be used in preparing teachers for grades four to nine inclusive whether in the old type of organization with seven or eight years in the elementary school or in the new type of organization having the junior high school.

The author, who has taught in all grades of the public-school system, has visited hundreds of teachers in their classrooms, has examined textbooks distributed over more than a century, and has read many books on methods bearing upon the contents of this volume, finds it impossible to make a separate acknowledgment of each service rendered; he therefore desires to record in a general statement his grateful appreciation of every assistance received. To different publishers for permission to quote from their publications, to Ginn and Company for the most cordial treatment in connection with this publication, and, finally, to his wife, Katharine D. Henderson, for constant encouragement and helpful criticism of the manuscript, the author wishes to express his profound gratitude.

JOSEPH L. HENDERSON

THE UNIVERSITY OF TEXAS

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MATERIALS AND METHODS IN THE MIDDLE GRADES

PART I. FOUNDATIONS OF MATERIALS AND METHODS

CHAPTER I

CHARACTERISTICS OF PUPILS IN THE MIDDLE GRADES

I. PHYSICAL CHANGES

Chronological ages. Children in the United States usually enter school at six or seven years of age. Assuming a normal rate of progress, a child will be nine or ten years old when he reaches the fourth grade. This is about the chronological age required for admission to many of the secondary schools of Europe. Accepting grades four to nine, inclusive, as the middle part of the public-school system, a pupil of normal advancement will be fifteen or sixteen years old when he or she completes the work of the middle grades.

Growth of bones. Within the period of pubic change the child experiences significant modifications in form and structure of bones. While increase in height, caused largely by the lengthening of the bones of the lower limbs, is, perhaps, most frequently observed, those who fit clothing to growing children note the great increase in length of arms, size of feet, and breadth of shoulders. But the change in size of bones in this period is also paralleled by the change in bone structure. Whereas the proportion of animal matter has greatly predominated until this time, the mineral matter now increases in amount and importance. The bones harden more rapidly, and the frame tends to become fixed for life. This is preeminently a time for bone development and bone adjustment.

Growth of muscles. Along with growth of bones there is a corresponding growth of muscles. It has been estimated that at birth the muscles constitute 23.4 per cent of the entire weight of the body; at eight years of age, 27.2 per cent; at fifteen, 32.6 per cent; and at sixteen the muscles compose 44.2 per cent of the body's weight.[1]

Since bones and muscles do not grow at the same rate, a lack of coördination is bound to result. Both boys and girls in the early years of adolescence tend to become angular, awkward, and physically ineffective. The angular appearance is due to lack of proportion, the awkwardness to incoördination of muscles and bones, and the ineffectiveness to lack of strength and habituation of the new accretions in bones and muscles. The control must, of course, come about through development of the nervous system.

Changes in the nervous system. Neurologists maintain that the brain has reached nine tenths of its final weight by the time the child is eight years of age. This assures the fourth-grade child of at least a gross nervous structure ready for minute development.

The central nervous system is ready for connection with bones and muscles at the onset of adolescence, the period of greatest growth. And since bones and muscles must be controlled through the nerves, their concomitant growth and coördination become matters of the greatest educational importance.

Since the gross weight of the brain will not be materially increased within the period under consideration, the significant changes must be looked for in the minute structure. The construction of the nervous system has often been compared to a telegraph system. The brain is the great central station, but there are many substations. Connections of the central station with the many substations are made by little wires called neurones. The stations, where the ends of the neurones approach or meet each other and through which the messages pass, are called synapses. In these synapses learning takes place and habits are formed. So, in getting control of new bone and muscle formations, or in learning new uses of old formations, new stations must be developed in the nervous system. These new stations (synapses) and these new wires (neurones) constitute the minute structure of the nervous system. Many changes take place in this structure during the part of the child's life spent in the middle grades.

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[1] L. A. Pechstein and A. Laura McGregor, *Psychology of the Junior High-School Pupil*, p. 13.

Changes in the vital organs. Certain parts of the body are called vital organs because they are essential to life. An arm, a leg, or an eye may be removed without loss of life, but the destruction of the heart or lungs would result in immediate death. Within the ages from nine to fifteen years the child's vital organs enter upon an unusual period of development. With the increased growth of bones and muscles, already mentioned, more blood is demanded. The blood must pass to the lungs for purification, and greater lung capacity is needed for this. Likewise more blood calls for more food. The food must be digested. This in turn requires larger and stronger digestive organs.

The ratio of the capacity of the heart to that of the arteries at birth is estimated to be about 25 to 20; at puberty, 140 to 50; at maturity, 290 to 61. The effect of the increase in the size and power of the heart compared with that of the arteries at puberty may be understood if compared to the effect upon water mains when a sudden force is thrown on at the pump house. The faucets and mains must withstand the added pressure. So it is with the capillaries and arteries when the force of the heart is rapidly increased. This vital change becomes more evident in the early years of adolescence.

The increased lung capacity is fraught with serious dangers. If the respiratory system is not properly developed, the foundation is laid for later, possibly fatal, pulmonary troubles.

The special senses. That the special senses should share in the enlarged growth of the body during early adolescence might be expected. At this time the taste buds seem to call for strong stimulation. This is probably caused by the new demands for food. Owing to the changes taking place in the body, children often prefer articles of food that supply strong stimulation to the taste buds rather than those that furnish suitable nourishment.

Some writers assert that sensibility to touch (heat, cold, pain, and pressure) becomes keener with the pubic change, resulting in important problems in sex control. Again, the sense of smell seems to be enhanced, as shown by a desire for strong perfumes and the keen enjoyment of the odors of flowers. The eye becomes more susceptible to colors. This may be caused by growth in parts of the eye, by enlarged mental powers, or by both. The growth in the several parts of the ear likewise has an effect upon hearing.

Changes in other parts. The well-known changes in voice are due to growth in length and thickness of the vocal cords, to enlargement of the air passages, and to changes in the shapes of the mouth and the nose.

Probably the most fundamental changes that ever take place in the human body are those connected with the organs of sex. These changes come in the middle grades of the school system and give rise to some of the most serious problems of social and physical control.

Morbidity in early adolescence. While the evidence so far tabulated seems to indicate a low rate of mortality among children from ten to fourteen years of age, "morbid conditions of both mind and body are at that time most frequent." [1] In the prepubescent period, or at the time the child of normal school advancement is in the fourth, fifth, and sixth grades, a permanent set of teeth is developed. Lack of proper attention to the child's teeth will not only result in suffering but in permanent deformities. The tonsils grow along with other parts of the nose and throat and may become causes of serious physical and mental disorders. The eruptive fevers, such as mumps, measles, chickenpox, etc., common to all children, may appear more generally because of school associations and wider social contacts. With changes in the senses, deafness and defective eyesight are likely to become more pronounced. These defects may be increased because of the more exacting types of school work imposed. Temporary illness produced by irregular eating or lack of hygienic attention to daily habits is very common. Owing to sex development, girls are more subject to morbid disturbances than are boys. Increase in the size of the heart may give rise to high blood pressure, and this, in turn, may produce abnormal mental states. Enough has probably been said to indicate the vast physical changes taking place in boys and girls in the middle grades and to suggest the need of an efficient health regimen for this period of child life.

II. MENTAL DEVELOPMENT

The mental and the physical. In the normal child mental development may be expected to accompany physical growth. Not only do the pleasurable stimulations derived from the proper use of a healthy body enrich experiences and increase mental power, but also the suffering resulting from disease or disorders has a decided mental effect. The body is more than a receptacle of the mind: it is the vital mechanism by means of which the mind grows and through which it expresses itself.

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[1] A. Inglis, *Principles of Secondary Education,* p. 19.

Mental phases. Formerly educational leaders believed that different phases of mind appeared in succession; that is, perception and memory functioned early in the child's life, whereas judgment and reasoning could be exercised only in later years. We now know that very small children can reason, and that the memory may continue to increase well into later life. The old theory led to an unsatisfactory type of school system, — a system that placed memory before understanding.

The new theory of mind development is now revolutionizing the work of the schools. Fundamental changes are proposed in both materials and methods. Children are now encouraged to reason as well as to repeat. While much time must be given to securing the tools of learning, — reading, writing, and counting, — these tools are now being acquired through use. The concomitant development of the different phases of mind is now considered not only possible but desirable.

Inheritance and environment. The relative importance of original endowment and external influences has long been the subject of strenuous debate. Recently men of science have entered the arena. Much attention has been given to a study of the original nature of man. One group of psychologists — Hall, Kirkpatrick, Thorndike, and McDougall — places great stress upon the instincts; another group — Watson, Kuo, and others — believes that original tendencies or instincts have comparatively little to do with conduct.

Not only do some psychologists attach great importance to the instincts, but certain years in the child's life are assigned for their several appearances. The more conservative advocates of the chronological order state that while the actual appearance may be dated, the preparation or growth has preceded the actual ripening for a considerable time. The sex instinct is cited as an example of this theory. Two factors of original nature seem to some to bear heavily on the work of the schools. These are (1) unlearned reactions and (2) differences in native abilities.

Unlearned reactions. As soon as the child is born the external world begins to play on his senses. One by one these respond, and outside influences come to play on his original nature. One of three results may follow: an established pathway in the nervous system may not be stimulated at all, or it may be stimulated unpleasantly (in either case the original impulse will ultimately be destroyed), or the native impulse, although originally bad, may be redirected and the response become valuable. Original tendencies, either good or bad, may be encouraged by proper stimulation. The entire problem of education, then, becomes a matter of the destruction, modification, or development of original nature.

We know that by the time the child enters the fourth grade whatever original tendencies he possessed at first have already been greatly modified by experience. But it would be a mistake to assume that his original nature has been obliterated. Curiosity may be increased and directed; manipulation may be guided into profitable channels; food-getting must be stimulated and controlled in many ways; bodily protection, through all its ramifications of clothing, shelter, and conflict, will require attention; and the powerful sex instinct, with all its accompanying social problems, is yet to come. Rather than declare that in the fourth grade we may consider ourselves rid of the instincts, it would be better to say that we must now deal with original nature modified by nine or ten years of experience. If this experience has been along right lines, well and good; if it has not, our problems become the greater. For we are not now to deal with nature, but with "ten times nature" in the pupils we teach.

Individual differences. Nerve matter possesses two native qualities which seem to lie at the foundation of mental ability. These qualities are plasticity and retentivity. Theoretically, we may think of a nervous system that would yield to new impressions with great difficulty and give up the impressions received with great ease; a person possessing such a nervous system would probably be called stupid. Again, a nervous system might be easily impressed and readily give up the impression; a mind based upon such nerve matter might seem brilliant if the test immediately followed the instruction, but should time intervene the impression would soon fade. Nerve matter may be thought of as possessing little plasticity but great retentivity. Such conditions would furnish a physical basis for the mind described as "slow but sure." Finally, the nerve matter of the genius would be characterized by exceptional power in both plasticity and retentivity. There may be a high degree of correlation between plasticity and retentivity; but if so, the nerve-quality theory is not destroyed as a basic factor of individual differences. Individual differences arising from native endowment make of every child a special problem. A better understanding of individual differences has brought war upon the old-time grading system. The effects are now reaching the upper grades of the elementary school and the junior high school. The appearance of variation in subject matter, directed study, promotion by subject, and optional studies are some of the results.

Widening interests. By the time the boy reaches ten years of age a larger life is open to him. Sufficient progress has usually been made in reading to enable him to enter the world of books. He may now revel in the limitless fields of imagination. Books of travel, deeds of heroes, and stories of animals hold his mind with relentless grasp. His desire for property makes him a robber, a trader, and a pirate. He will rob the nests of birds, trade articles with playmates, and forage fields and factories that he may enjoy and even gloat over his possessions. The girl at ten will usually be more interested in books than will boys. Her interest in possessions may reflect characteristics of her sex, but it will not be less keen than her brother's. She will rob others of trinkets, exchange ribbons with her companions, and join her brother in foraging for food, flowers, or furnishings.

Children of all ages play; but by the time the primary grades are completed, the disposition to construct is pronounced. The girl may make a dress, prepare a meal, or decorate her own room; the boy may build a kite that will fly, a trap that will hold, or a tool that will work. In short, by the time the child is ten, wider interests will command his attention. He will no longer be entertained by monotonous or meaningless tasks. If the school is to enlarge his interests, feed his imagination, encourage his normal physical and mental expression, or influence his ideals and conduct, it must provide a larger program for him.

Thought processes. If the small child thinks little, it is most likely because of lack of nerve development or thought materials, or of both. In order to think, it is necessary to have something to think about: one must have experience. That the gross brain structure is ready for the development of minute structure by the time the child is nine or ten years old has already been noted. Wider interests lead to richer and more varied experiences. The wider experiences provide the raw materials for all types of reasoning. Reasoning may be on the plane of immediate, practical needs, in the field of current curiosity, or on the level of scientific investigation. The child begins at an early age to ask the "why." Soon he wants to know the "how." He assumes a hypothesis and goes forward to test its validity. The old doctrine led to a provision in the middle grades for much memory work and little discussion. The subject matter dealt with conclusions rather than with problems. It was the pupil's duty to accept and not to reason. It was thought that if the child's mind was well stored with facts in his early years, some day he might come to understand them. The fundamental principle in psychology that understanding must accompany interest was disregarded. Today we are proposing to make experience the foundation of subject matter and understanding the basis of learning. This will mean that all phases of mind will be developed concurrently and that reasoning will become the chief counselor of the mental processes. It is now proposed that the middle grades shall participate in the development of all the child's mental powers and not attempt to shift the use of the so-called higher thought processes to later years.

The emotions of early adolescence. The instincts have their physical foundation in the cerebrospinal nervous system; the emotions, which parallel the instincts, have their fundamental basis in the autonomic, or sympathetic, nervous system. But since the two divisions of the nervous system are connected, the emotions affect the organs and processes of the entire organism; that is, the physical and mental operations influence the emotions, and the emotions in turn react upon physical and mental conditions. McDougall coördinates instincts and emotions and gives to the emotions equal importance with the instincts. The child is born with certain emotional patterns, just as he is born with certain instinct patterns.

Since the instincts and habits are so intimately related to the emotions, the entire scheme of education must take into consideration both phases of mental development. The emotions must be suppressed, directed, or developed. The emotions of fear, hatred, love, and the like may be made the greatest hindrances or the most valuable helps in the development of character, depending on their control and application. The effects of anger and rage on the bodily functions are no less marked than their influences on the thought processes. The raging intruder is banished from society, but the person incapable of resentment is without character. The possibilities for development of the higher emotions are no less than the opportunities for the education of the purely intellectual processes.

With the increased bodily growth in early adolescence, accompanied by wider radiations of interests and greater development of the thought processes, will come a corresponding expansion in the volume of the emotions. The large elimination in the upper grades of the elementary school and the lower grades of the high school may be attributed more to erratic emotional states than to conclusions reached through reasoning. Wounded pride because of reflections upon dress, personal appearance, or physical deformities; disappointment because of failure in promotion or school achievement; abnormal hatred of required subjects, of certain school routine, or possibly of a classmate or the teacher; unrequited affection; or failure to find in school opportunities for proper emotional expression, — all or different ones of these lead many pupils in the unsettled physical and mental conditions of early adolescence to prefer the outside world to school life.

III. SOCIAL ATTITUDES

Social motives. Two antagonistic theories prevail as to the original causes of social organizations. One theory would make selfish interest the motive of all conduct; the other would admit the welfare of others as a strong factor in social coöperation.

Allport, after citing the opposing theories of Le Dantec and Hirst, concludes: "The truth of the matter probably lies between these two doctrines."[1] McDougall, who makes much of the social instincts, remarks: "The parental instinct especially impels to actions that involve self-sacrifice, in forms of suppression of the narrower egoistic tendencies, and of heavy and unremitting toil on behalf of the offspring."[2] A combination of egoism and altruism seems to furnish the best working basis for the development of modern society.

The family. The family has been the most potent social group of all time. The first six or seven years of the child's life are spent almost altogether under the immediate influences of home life. Not only has the family been the forerunner of all other social organizations, but it will continue to be essential to their success and perpetuity.

The native impulses are first played upon by the home environment. Language, manners, dress, food, social conduct, and moral ideals of the home make the first impressions on the child mind. It is here, next to native endowment, that we get the greatest factor in individual differences. The variations in social attitudes and social development resulting from home conditions give rise to many of the most serious problems of school life.

The school. By the time the child enters the middle grades the school comes to share with the home greater responsibilities for his social training. Many times a conflict seems inevitable. Children reared under free home conditions will find school conditions formal and repressive, and children from homes with low social standards may find adjustment to the higher social standards in the schools a difficult task. In either case a burden is placed upon the schools. Furthermore, this burden

[1] F. H. Allport, *Social Psychology*, p. 390.

[2] William McDougall, *Social Psychology*, p. 275.

will be increased as the pupil passes into the years of adolescent change. In conjunction with physical growth and mental development will appear an enlargement of social interests. Unless home life and school life are coördinated, either the home or the school, or perhaps both, will lose the battle, and an immature, undeveloped, and unprepared personality will be thrown on the world.

Gangs. The gang spirit mounts high in the middle grades. Unless groups are provided by older persons, children will organize themselves. Witness the success of such organizations as the Boy Scouts or Camp Fire Girls, composed largely of pupils in the upper grades of the elementary school and the lower grades of the high school. The boy's club is an epitome of youth's fraternity, the young man's lodge, the adult's church or fraternal order. Probably no other social impulse, save sex and mother love, is more vital to public welfare than the disposition of people to band together for a common cause. Many now hold that the schools can render no greater service to the community, to the state, or to the nation than to promote and properly direct suitable organizations for young people.

Sex problems. Before the pubic change, boys and girls are much alike in interests and activities. They play together or work together with little consideration for bodily differences or sex relationships. Whether we accept the theory that sex functions are ripening through all the prepubescent years and reach maturity in early adolescence, or that they burst forth as a result of sudden physical upheavals, is a matter of secondary importance in this connection. The fact remains that with the differentiation of sex there appears a formidable array of new social tendencies. The social problems of sex have long been regarded as matters of such grave importance that in certain uncivilized tribes the two sexes were completely separated at the time of the pubic change and were not allowed to come together until marriage vows were consummated. Among many civilized peoples separate schools for the two sexes are still maintained.

With the sex development come timidity, bashfulness, self-consciousness, shyness, and secretiveness. New social adjustments must be made. Dress becomes a matter of great importance. Methods for attracting attention are studied, and strutting receives a new impulse.

Attitudes toward parents, brothers, sisters, or home may change. Lack of parental understanding or proper sympathy may lead to withdrawal of confidences or, possibly, to running away.

Since the American public school admits both sexes on equal footing, it is confronted with the multitudinous problems of social control, for it is at school that the sexes are often thrown into most intimate social contact. Here attitudes toward members of the family, toward members of the same or the opposite sex, toward school and all its organizations, toward outside institutions including the church, toward duties to the state, and toward other social contacts are changing.

Moral law. With the expansion in mental growth and the extension of social relationships comes a greater understanding of moral law. Respect for constituted authority, proper regard for property rights, respect for the general welfare of others, due regard for public opinion, obligations to support public institutions and those basic principles which underlie civilized life, become important subjects for consideration in the middle grades. Whether the pupil knows it or not, in these years he is forming permanent attitudes toward moral conduct. In this period of social adjustment bad associations, corrupt standards, low ideals, or wrong examples leave an indelible impress on character. Loose morals in the early years of adolescence will most likely lead to gross immorality in adult life.

IV. CHAPTER SUMMARY

Physical changes of pupils in the middle grades occur (1) in the growth and solidification of bones, giving rise to angularity, crookedness, and weakness in the human frame; (2) in the enlargement and extension of the fundamental and accessory muscles, as reflected in awkwardness and lack of efficiency in bodily control; (3) in the nervous system, enabling the individual to coördinate the growing bones and muscles in the formation of new habits of thought and action; (4) in vital organs, as shown in blood pressure, lung power, and food requirements; (5) in the special senses, which seem to demand more varied and more intense stimulation; (6) in the vocal organs, as shown in changed pitch and quality of voice; (7) in the organs of sex, as reflected in new functions; (8) in morbidity, a natural result of nature's protection to all the organs of the body now being enlarged and organized into a wonderful mechanism for the indwelling of the spirit of man.

Concurrent with the physical changes of pupils in the middle grades, mental growth becomes evident (1) in physical control, as shown in increase, grace, and control of bodily movement; (2) in development of the phases of mind — perception, memory, imagination, and reasoning; (3) in inherited tendencies, as reflected in the child's conformance to civilized customs regarding property rights; (4) in individual differences resulting from varying forms of education and made evident by many types of interests and different grades of achievement; (5) in wider interests, as shown by versatility in different fields of knowledge and of physical and social activity; (6) in the realm of the emotions, arising partly from the maturation of sex and partly from widening experiences as divulged in an almost constant search for a "thrill."

The human infant, in common with other animals, is a selfish being. Early life is controlled largely from an egocentric basis. The most difficult task in education is to develop proper social attitudes. These are greatly influenced by social standards in the home. When the child enters school, conflicts are sure to arise. By the time he reaches the upper grades of the elementary school and the lower grades of the high school he may come to appreciate to a greater extent the alterocentric point of view. In the middle grades social impulses are in an unstable state of equilibrium. Attitudes toward home, school, the opposite sex, or future life work are all subject to radical changes. Social problems arising from the development of sex place a heavy responsibility on the schools. Finally, along with physical growth, mental development and expanded social relationships, as results of school life, may come a better understanding and appreciation of moral law.

EXERCISES

1. Because of physical changes the conduct of children is often misjudged by parents and teachers. Make a list of misunderstandings arising from natural growth.

2. Make a drawing of a simple system of neurones and explain how habits are probably formed; how old habits are broken.

3. Make a list of ten problems that may arise in connection with the care of the special senses within the period of early adolescence.

4. Explain how mind development of pupils in the middle grades affects their attitudes toward different subjects taught in the schools.

5. Show, in the development of any individual, that inheritance and environment are interdependent.

6. Enumerate the principal causes of individual differences.

7. Why is it that the grandmother sometimes says that she is "just playing" when she is knitting, and that ten-year-old Mary complains that it is "hard work to play the piano"?

8. Explain the statement "The emotions of fear, hatred, love, and the like may be made the greatest hindrances or the most valuable helps in the development of character, depending on their control and application."

9. Enumerate some of the causes that may lead some pupils in the middle grades to prefer home life to school life and others to prefer school life to home life.

10. Compare the relative values of moral instruction given at stated periods by special instructors and of that given in connection with other subjects and general school activities.

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CHAPTER II

PURPOSES OF THE MIDDLE GRADES

I. DEVELOPMENT OF THE BODY

Origins of the health movement. Until recently a widespread and effective interest in the physical welfare of children had not appeared in the schools. Today, as never before in the United States, we find, as a prerequisite to all other considerations, a growing tendency to place at the foundation of the entire educational system adequate provisions for the care and development of the body and the establishment of proper health habits.

Credit for this increased interest cannot be placed directly with the schools. The two principal causes of the movement must be attributed to science and philanthropy. Medical men first pointed the way, and philanthropists provided the means for combating vicious diseases that were preying upon human life. The discovery and control of deadly germs, the establishment of institutions for the maintenance of better health conditions, and the constantly increasing value put upon human life as civilization has made headway may be named among the forerunners of the new movement. Incapacity for military service, economic loss through sickness or lack of physical efficiency, with the heavy drain placed upon philanthropy and the public treasury in caring for the physically incompetent, have contributed to the growing interest in health education. It is not strange that finally an impelling responsibility should be felt by the schools.

Diagnosis. The basic requirement of any successful business is a good accounting system. The first step in the application of an accounting system is to take an inventory of property on hand. The school is a big business. It receives raw materials and passes them through certain processes with a view to obtaining certain products. One of the products desired is a strong, healthy, and useful body.

From inheritance, lack of nourishment, abuse, or improper care, children's bodies may be defective in many ways. The first duty of the school on receiving pupils is to make an inventory of their bodily conditions. Skeletal deformities, muscular weaknesses, defects in the special senses (especially abnormalities of sight and hearing), irregularities in the form of the nasal cavities, diseased tonsils or defective teeth, imperfections in vital organs, such as weak heart, low lung capacity, deranged digestive organs, or inefficient excretory system, should all be charted with scientific care.

Charts and records. For some time records of mental achievement have received consideration; now, the equal importance of keeping complete physical records is coming to be more and more realized.

The schools should not only show records of the conditions of the bodies of children when they enter school, but they should construct charts showing the progress in the physical development of each child throughout his entire school course.

Remedial measures. It may be argued that the remedial measures for the improvement of the bodies of children should be left to the parents. If this course be pursued, any one of three serious difficulties may be encountered: parents may be prejudiced against surgery and other remedial measures, they may be ignorant of the physical needs of their children, or they may lack funds with which to meet bills for medical service. No one would assert that the first obligations do not rest with the parents; but when parents fail to care for their children the responsibility must be assumed by the state. Indeed, the entire public-school system was called into existence because the parents could not or would not provide for the proper education of their children. The state makes school attendance compulsory, but parents may send their children to private institutions for instruction if they so desire. When parents fail to provide private instruction the state sends officers to force the children into schools. Likewise, when parents fail to care for the health of their children, the state should intervene.

Very definite steps have marked the development of health education in the schools. At first more sanitary conditions were provided. Left-side lighting for schoolrooms, provision for drinking fountains, bathing equipment, and better toilet facilities are some of the results of the health movement. One of the first legal steps taken toward health education came in the form of exclusion from school of children suffering from infectious or contagious diseases. Then came partial or complete diagnosis, first by voluntary service and later by school physicians. Next followed the establishment of school clinics in which teeth were filled and minor surgical operations were performed. And the end is not yet. If the state is responsible for the blind and the deaf-mutes, how can it escape the responsibility of caring for the bodies of growing children who otherwise may not only become economically unproductive but also may become a public burden?

There may come a time when the state will provide diagnosis and remedial measures for all children outside the schools; but under present conditions the schools furnish the best organization available for making a check on the physical condition of young people. As previously indicated, it is not proposed to deprive parents of the privilege of using home physicians for treatment of their children. School physicians may make the diagnosis and report needs to parents, treating only such cases as do not receive proper attention at home.

Food supply. A scientific study of physical growth leads directly to the food supply. The teaching of domestic science in the schools has resulted in great benefit to the home. Writers on domestic science have put into the homes helpful directions for feeding the family. Demonstration agents, not only in public places but in private homes, have illustrated the proper selection and preparation of foods. Intelligent mothers have been led to give more attention to the baby's nourishment and the school child's lunch. Another significant contribution to health education was the introduction of school lunch counters. The school cafeteria provides a demonstration of three important food considerations: selection, quality, and economy. The last factor named has placed the school lunch within the reach of all classes. The home has been freed from the laborious task of preparing a cold lunch, and the child is greatly benefited in the enjoyment of well-selected food properly prepared.

As a part of the health regimen for school children in some schools, teachers have ascertained what their pupils eat at home. It has been found that many children have coffee but no milk for breakfast; heavy, soggy bread and molasses for lunch; and meat but no vegetables for any meal. In some cases schools have put on drives for better selection of food in the homes. Parents have been urged through the children to substitute milk for coffee and to provide vegetables each day for the entire family. Some schools have gone still farther and have furnished a bottle of milk at a nominal price for children under weight; and in some places a free bowl of soup is provided for every child's lunch each day. The suggestion has been made that since the state provides free books, free instruction, and compels attendance, it is no less its duty to see that children are in physical condition to profit by the instruction provided.

Hygienic habits. Rules without application are generally a useless possession. The prime object of health instruction is the establishment of hygienic habits. With small children habits are formed without reason in response to instinctive impulses or natural cravings. In early years better physical habits must be imposed from without. Food supply must be carefully selected and properly guarded to avoid the evil effects of gluttony. The simplest hygienic laws may be disregarded by young children, with impaired health as the inevitable result. Unfortunately health conditions in many homes are deplorable. Sleeping conditions, food supply, and practices in the most fundamental phases of personal hygiene are all of a low order. Many parents are ignorant of and indifferent to the health habits of their children.

In many cases little can be done with the parents. Reforms must be introduced through the children by means of instruction in the schools. Furthermore, the middle grades in the schools will have the paramount opportunity. The health habits of the pupils in the primary grades will be enforced by authority rather than by reason, but in the middle grades the subject matter, social relationships, an understanding of the laws of physical welfare, and the attainment of higher ideals of living will furnish a foundation for improved hygienic habits. As a result of school instruction higher ideals of bodily welfare and better hygienic habits may be carried into the home.

A health regimen. The more progressive school systems are now organizing comprehensive programs of health education. The first step in the movement looks to provision for an adequate school plant. Hygienic conditions include the basic factors of heating, lighting, ventilation, water supply, toilet facilities, seating, and cleaning. The development of score cards for rating school buildings has been a distinct contribution to health education. The second group of factors in the health regimen includes gymnasiums, shower baths, swimming pools, cafeterias, as well as offices for nurses, medical attendants, physical examinations, and clinics. A third division of an up-to-date school plant will include well-equipped playgrounds conducted under the immediate direction of scientifically trained physical directors.

An adequate health regimen will include thorough diagnosis, a complete system of records, a well-organized theoretical course on the anatomy, physiology, and hygiene of the human body, remedial measures effected by means of school clinics and home physicians, provisions for a suitable food supply through the school cafeteria and home arrangements, faithful observance of rules of hygiene, and a well-organized system of exercises including a large variety of plays and games.

The important physical changes taking place in the middle grades make the health regimen of such prime importance as to tax the home and the school if adequate provisions are to be made for the proper care of the growth and health of children in their preadolescent and early adolescent years.

II. THE DEVELOPMENT OF SPEECH

Origin and importance of speech. Speech as here treated includes content as well as form of expression. Next to food and bodily activities comes the fundamental need of mental communication. This need lies at the foundation of all languages. The utterance of sounds indicative of physical dangers or desires appears in low forms of animal life; indeed, from crude beginnings the most complex forms of vocal language have been evolved. Vocal language and gesture language have developed concurrently. The lion growls and shows his teeth; the dove coos, flutters his wings, and struts in front of his mate. Fear, anger, hunger, pain, pleasure, love, hate, with other sentiments and emotions, provide the basal demands for all language.

The languages of animals are limited because their mental processes are meager; languages of human beings have been and will continue to be elaborated in keeping with man's limitless development of mental activities. The languages of animals — vocal and gesture — pertain to the preservation and welfare of the body. Since animal life changes little or none within a generation, improvement in its language is not required.

Because of man's higher mental development his gesture language has been extended to facial expressions and to a large variety of movements of limbs or contortions of the body to express his desires and emotions. Through gestures of parts of his own body man was able to point to external bodies in conveying thought. When the objects needed were absent he represented them by crude drawings and finally developed the written or printed words as signs of ideas. Spoken language serves immediate life conditions; hence the development of variations as reflected in provincialisms and dialects. Spoken language not only precedes written language with the child, but continues throughout life to be his almost constant means of communication. It has fallen to the schools to teach the written language, but in so doing they have often lost sight of the prime importance of spoken language.

Organs of speech. The change in voice in early adolescence, more marked in the male than in the female, usually passes with little or no significance to the schools. The occasional break of the voice in class with the attendant embarrassment to the owner may even be made the butt of a joke or an uncomplimentary remark. Usually little attention is given to the changes going on in the vocal organs. Too frequently the term "vocal organs" is limited to the vocal cords and the structure of the larynx alone, when, as a matter of fact, the diaphragm, lungs, mouth, nose, and ears, with all their component parts, must be included in the vocal apparatus. Weaknesses, diseases, or abuses of any of these parts tend to destroy vocalization. When the extent and delicacy of the complex structure are considered, we should not be surprised that there are so few good vocalists. Weak or diseased lungs, irregular formation of cords or larynx, irregular shape of mouth, teeth, tongue, or tonsils, and irregular structure of the nasal passages, with the attending dangers of such diseases as adenoids, colds, catarrh, tonsillitis, pulmonary troubles, — all these, as well as strained organs, contribute to the failure of the voice to function properly.

In the middle grades the child is going forward with the changes from a temporary set of twenty teeth to a permanent set of thirty-two teeth; the vital capacity is increased, with attending dangers; the vocal cords lengthen and thicken, with an accompanying enlargement of other parts; all of which changes call for careful attention to proper diagnosis and remedial measures in caring for children's organs of speech from ten to fifteen years of age.

Vocalization and voice culture. Though organic structure and hygienic treatment are prerequisite to proper function, development of the organs of voice through intelligent use is a legitimate work of the middle grades. The elementary factors of vocalization — enunciation, articulation, and pronunciation — should receive attention while the new adjustments of organic structure are in process and before loose habits of voice control are established. With healthful structure of vocal organs provided, voice culture becomes a matter of mental and muscular control. Though some parents may provide vocal training for their children, others will not be able to do so. The schools have attempted to give voice culture in connection with reading and speaking, and more recently some progress has been made with choral singing. The importance of the voice as an instrument in æsthetic, social, and commercial life demands that the schools shall not only search out those who are especially gifted, but that it shall give to them a preliminary training and then commit them to the care of the specialists. The just dues of every child require that his vocal organs be put into the best possible condition and then brought under effective mental and muscular control.

The content of speech. A word is the sign of an idea. Ideas may be expressed by words in vocal language or by characters in written language. The schools have been charged with the mistake of dealing in words and omitting ideas. The spelling of words apart from their meanings, perfunctory and unintelligent reading, the structural dissection of sentences apart from the thought they express, the laborious construction of paragraphs without vital meaning to the writers, the study about literature while omitting an examination of the masterpieces themselves, have been at times the popular forms of language teaching. Children in the middle grades will not long endure this kind of instruction. Younger pupils may be compelled to remain in the primary grades, but their growing intolerance will overflow. This accounts in part for the heavy elimination from school about the beginning of adolescence. The type of language instruction here proposed will place ideas before words, thoughts before sentences, and oral speech before written forms.

The vernacular and foreign tongues. Different languages are merely different forms for the expression of ideas. Many ideas are common to many peoples; it is often only the characters and forms of expression that differ. If the minds of different groups work differently, it is because they are adjusted to various systems and not because they originally demanded a different psychology. In recent times linguists have prepared a common approach for the teaching of all languages. The approach proposed would begin with content and the spoken words instead of with written symbols. It is furthermore suggested that the study of foreign tongues be begun while the organs of speech are in the state of adjustment. This would lead to the study of foreign languages in the middle grades.

Form and use. Two opposing views prevail with regard to language teaching. The one has led to concentration upon form, the other to a preference for use. Those who accept the form theory hold that a language may be learned best through study of spelling, grammar, and the science of composition, whereas those who stand for the use theory turn more to content in both oral and written work. The latter theory will be made primary and the former secondary in the proposals for language instruction found in a later chapter of this book.

III. THE DEVELOPMENT OF SOCIAL RELATIONSHIPS

Social traits. Either original nature or life experiences give to man a large number of social traits. Thorndike names as social instincts motherly behavior, gregariousness, attention-getting, responses to approving or scornful behavior, mastery and submission, rivalry, envious or jealous behavior, ownership, kindliness, teasing, tormenting and bullying, and imitation (with qualifications). He states, "Human intercourse and institutions are as surely rooted and grounded in original nature as man's struggles with the rest of nature for food and safety."[1] This explains man's craving for social contacts.

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[1] E. L. Thorndike, *Educational Psychology, Briefer Course*, p. 27.

The family a social organization. The reproductive instinct, mother love, and blood relationship are some of the elemental bonds that give rise to the family. Care of the young among the lower animals is largely limited to immediate offspring. In man it leads to a broader altruism which reaches beyond the family, extends to the tribe, and finally may eliminate the boundaries of nations or races.

Family relationships involve the fundamental principles that control all social organizations. Not only was the family the first social organization, but it has been the prototype of all succeeding social groups. The tribe, the state, the League of Nations, alike must conform to the same social laws that govern family relationships.

Mother love in the family becomes elaborated by the state into protection and care for every citizen. As the mother will fight for her child, so will the state go to war for a citizen assaulted by another state. Just as parents protect and teach their children, so does the state protect and educate its citizens. The family is a herd; the state is a larger herd. Every social trait — attention-getting, desire for approval, etc. — operates alike in the home and in all other forms of social groups.

The school a group of families. The mother has always been the child's first teacher. Soon other members of the family come to assist with instruction. In former times when the girl reached the age for formal instruction the mother assumed entire control; the boy beyond the tender years passed into the father's hands. As social life became more complex, responsibilities in the home increased and the mother needed assistance. The governess in the nursery, the dame in her kitchen, and the teacher in a separate building represent stages in the development of the school, which has come to combine families into larger and larger groups.

The state a group of families. The enlargement in organization from the family to the tribe and then to the state has been a result of the application of social laws inherent in domestic life. Protection, physical welfare, mental development, ethical conduct, group achievement, and proper enjoyment constitute the cardinal objectives of all worthy social groups.

The enlargement of the groups extends social contact, increases the number and complexity of social problems, and calls for higher and higher applications of social principles. This requires an ever-increasing understanding of social laws, a demand that has caused the state to require the teaching of social subjects in the schools.

The state does not seek to destroy the family unit, but merely attempts to assist and extend the family life. Laws are enacted for the support of family relationships. The state supports the sanctity of marriage vows, the protection of children against harsh treatment or deprivations, the rights of property, provisions for caring for the unfortunate, and compulsory public education, not to deprive the family of its rights but to insure the proper exercise of family duties.

The church a group of families. While the church holds as its highest aim the worship of a Supreme Being, it shares with the family and state certain common ideals and principles of control. The father in the family becomes the pattern for the chief in the tribe, the ruler in the state, or the head of the church. The earthly father is deified in the Heavenly Father. The social attitudes of love, self-abasement, fear of others, consciousness of self-limitations, obedience, justice, gratitude, altruism, all function in family and church alike. Sometimes the common relationships are not understood, as when the Indian mother throws her babe into the Ganges to appease the wrath of her god; but this conception of religion is accompanied by low forms of all other social relationships.

Next to the family, the church was the most powerful social institution of early times. For centuries it ruled the state. When the state denied to the church a dominant control, it incorporated the fundamental principles of the church in its constitution and laws. We continue to speak of the Buddhist, the Mohammedan, or the Christian nations. There is no intention here to assert that the church should rule the state, the schools, or the family: it is merely proposed to point out that all social institutions observe many principles common to all.

Social principles. A study of the formulation and application of social principles occupies a major field of human knowledge. Development of the body seems to be prerequisite to all other achievements, power of communication lies at the foundation of mental development and human relationships, and a knowledge of basic principles is necessary for the successful operation of all social institutions. These principles must be sought in the depths of private and public welfare. Procreation is essential to the perpetuation of the race. From this necessity have evolved codes of laws controlling sex relationships. The human infant is said to be the most helpless of all animals; however this may be, it is conceded by all enlightened minds that the young should not be expected to compete with the mature. Here a system of regulations, both protective and constructive, has arisen.

The indefinite enlargement of achievement through coöperation has furnished the premises for the organization of larger and larger social units. Interrelationships of members of a group stimulate individuals to greater effort and greater accomplishment. The roots of social principles may be traced to the original nature of man; the principles themselves have been developed through the growth of social institutions.

The growth and application of social principles have provided a vast store of knowledge which must be transmitted to each succeeding generation. This knowledge has often been segregated in separate departments and taught with little regard to social needs or social relationships. More recently the term "social studies" has come into use; and along with the reorganization of materials has come a more fruitful attempt at application. As an adjunct of the home by origin, as a ward of the state by adoption, and as an instrument of the church for training in fundamentals, the school is called upon to ground the child in the theoretical and practical principles of social control.

Social relationships in the middle grades. The upper grades of the elementary school and the lower grades of the high school provide an unusual opportunity for social training. The first years of the child's life will be home-centered, but by the time he is nine or ten years of age many outside relationships are added to those of the home. Soon social relationships revolving about sex will arise. Clubs and gangs, unmistakable signs of wider social cravings, appear. Property rights begin to take on a broader meaning. Interest in local, state, and national government may be aroused. Intelligent and permanent attitudes toward the church may be established. The importance of improving the ideals of social relationships in these school years is accentuated by the fact that large eliminations by the end of the middle grades will remove many future citizens from the pale of school instruction and send them into life without a proper grounding in social principles.

IV. THE UNDERSTANDING AND PRACTICE OF ECONOMIC RELATIONSHIPS

The property instinct. In animals the property instinct is exercised in the search for food and shelter. Birds as well as animals build houses and lay up a winter's store. But the nests of birds and the dens of beasts are not improved from generation to generation. The superiority of man over other animals was first exhibited in the improvement of food, in the invention of clothing, and in the construction of better homes. Although beginning on the plane of animal necessity, the property instinct in man has led to the development of an economic system that involves the entire human race and drives many individuals to a lifelong struggle for larger and larger possessions long after a competence in material goods has been secured. An understanding of the principles that control this economic system and of the best procedures for their application constitutes one of the most interesting and valuable fields of human knowledge.

Division of labor. For centuries labor activities were simple in form, consisting of the construction of rude homes or the capture and preparation of such food as nature provided. But man, possessing higher endowment than lower animals, was not satisfied with uncooked foods, skins of animals for clothing, or caves for houses. For a long period of time women were required to prepare the food and clothing while the men spent their time in hunting or in martial pursuits. The emergence from savagery witnessed a more extensive cultivation of the fields and the invention and use of more efficient tools; with the larger development in the use of tools came the division of labor.

Rise and influence of trades. Individual differences in interests and abilities enabled certain men to perform one task better than another. This resulted in both economy and efficiency, which caused certain trades to become established. Later, guilds were formed for the mutual aid and protection of groups engaged in the same trades. Efficiency in the trades was promoted by the establishment of ranks among the trade workers. The apprentice, the journeyman, and the master denoted stages in training. Guilds of the tradesmen sometimes sponsored schools and later gave to the academic world the well-known degree of "Master of Arts." Those who worked at trades had no time to distribute their wares, so a special group of traders, or a merchant class, arose. In short, the division of labor into trades was a prime factor in the development of our present-day complex economic system.

The development of industries. The development of the use of tools has been a major factor in the growth of civilization. Tools that were used only in the hand were followed by tools that could operate alone when properly adjusted. As soon as man learned to harness the forces of nature he began to compel them to do his work. With the invention of new mechanisms trades were changed into industries, and machinery came to multiply products a thousandfold. This development provided more adequately for the basic needs of food, shelter, and clothing, and at the same time set many workmen free to develop new trades or to devise new industries. And so it has come to be that one who can supply a new article contributive to need or convenience or who can invent a new method of production is honored above all others of his fellow tradesmen. Out of the trades came industries, and out of the industries come incentives for more and still greater inventions.

A necessity for commerce. The development of trades and industries has been accompanied by similar growth in commercial systems. Raw materials had to be assembled and finished products distributed. For these services huge systems of transportation became necessary. Buildings had to be provided for housing raw materials and finished products. A medium of exchange was needed. To meet this need banks, with other types of commercial institutions, arose; a monetary system has been established and large accounting systems have been organized. Since the future citizen will be a part of this economic system, the child in the middle grades should be brought to at least a partial understanding of simple economic relationships.

Prevocational guidance. The introduction of a study of economic relations in the middle grades is supported by very definite and substantial claims. Children from ten to fifteen years of age become interested in many things. The property instinct becomes developed, and enlarged needs for money call for remunerative work. Economic conditions often compel withdrawal from school. Children leaving school for work are likely to fall into blind-alley jobs. In many cases this is caused by lack of knowledge concerning the possibilities or limitations of different lines of work. For those who reach the middle grades it is proposed that exploratory courses shall be arranged. Among these exploratory courses are included different phases of trades and industries. Not only may interests and aptitudes be tested, but the elements of certain skills may be acquired. A wholesome respect for manual labor, with a more sympathetic attitude toward all forms of commercial and industrial life, may result. Furthermore, geography, applied arithmetic, or forms of English composition may be motivated by applying them to commercial relationships. It is maintained that the inclusion of home economics and manual arts in the program of studies for the middle grades has had a salutary effect upon the retention of pupils in school. Whether from the angle of those who leave school early or of those who expect to continue through high school, whether from the standpoint of future life work or of the cultural advantages obtained, a larger study of economic relationships seems to be eminently justified. And although the work in prevocational guidance is still in the experimental stage, the results obtained in the motivation of school interests alone will assure its further development.

V. MAN'S RELATIONSHIPS WITH NATURE

Ignorance of natural laws. Ignorance of natural laws has formed the basis for much of the superstition, physical suffering, and worry in the life of man. The shock of thunder, the flash of lightning, the fall of rain or snow, the rush of torrents, the aspect of the heavens, the effects of the internal processes of the earth as exhibited in volcanoes, earthquakes, or giant geysers, the changes in seasons with all the attendant effects upon plants and animals, have always filled unlettered minds with awe, fear, or consternation. Fear and consternation have led to the wildest superstitions, which have played a commanding part in the religions of all primitive peoples. Ignorance of the structure and functions of the human body or its relationships to external nature and natural laws[1] has often brought abuse, disease, suffering, and premature death. Failure to understand the intimate relationships of mind and matter, or the influence of environment upon the development of mind, led to the exclusion of nature as a means of mental development. This lack of understanding not only subtracted one of the most fascinating fields from the domain of human knowledge, but resulted in the failure to utilize one of the most valuable means for the motivation of learning. This is especially true of children in the period when their minds are opening to the outside world and inquiries arise as to their own origin, the uses of plants and animals, the sources of winds and the causes of storms, with thousands of questions that pass through their minds never asked and therefore never answered.

Nature as an enemy. For thousands of years nature was looked upon as an enemy to mankind. The evil effects were more often observed and stressed than the benign ones. In religion the body was a burden to be abused or despised.

In war the winds, waters, and storms were often regarded as enemies to be appeased or to be scourged. For ages the uses made of animals and plants too often involved their destruction. The effects of the sun's rays on the earth were noted in the withering of crops or in the necessity for protection. The evil effects of snow and ice were observed in connection with their obstruction of woods and streams, which constituted the sources of food. Diseases were attributed to evil spirits that lurked in shades or streams; the great physical laws of matter were unknown, and their effects were to be avoided.

Nature as a friend. When man came to understand nature and nature's laws he began to look upon her more and more as a friend. The lightning, formerly viewed only as a deadly enemy, when controlled became his swiftest messenger. His body, once regarded as a festering burden, when given proper treatment became an instrument for his highest mental and spiritual development. Animals and plants, when better understood, came to be recognized not only as a source of food when destroyed but as man's greatest allies when cultivated, trained, and applied to other services. The cultivation of trees produced more and better fruits; the care and protection of certain animals provided more and better foods. The laws of force, formerly avoided, when understood and controlled came to do man's work. For ages the untold treasures of nature were unknown and therefore undisturbed and undeveloped. Through greater knowledge of nature's laws disease has been checked and suffering alleviated. The hunter who formerly remained on the earth's surface has delved into its depths to reveal a bounty in nature still beyond calculation.

Sciences in the middle grades. At first sciences were taught only in the colleges; later they were pushed down into the upper grades of the secondary schools; more recently, a study of man's everyday relationships with nature has been proposed for the middle grades.

So unavoidable is our contact with nature and so vital to human welfare is a knowledge of nature's laws that it seems imperative to teach some form of science in each of the grades under consideration.

VI. ÆSTHETIC RELATIONSHIPS

Art appreciation. Art appreciation is one of the highest forms of personal enjoyment. Harmony of sounds provides the field of music; arrangement of colors becomes the subject matter of painting and decoration; proportion in form lies at the foundation of drawing, modeling, sculpture, architecture, landscape architecture, and house-furnishing; gracefulness in movement is represented in dancing and dramatic art; beauty of ideas is expressed in the highest types of literature.

Art appreciation is not limited to any race or group of people. Savages and even the lower animals exhibit different emotional responses in accordance with the arrangement of sounds. The decoration of the body, first with colors and then with ornamentation, may be traced throughout the recorded history of the human race. Appreciation of the fine arts has always been used as a standard for judging the stage of development of the race, and producers of art have been ranked with the greatest benefactors of the world. Preparation for the worthy use of leisure time is one of the principal demands of educational leaders today; when translated into practical terms it means, to a large extent, the production and appreciation of the fine arts.

In their relationships to the fine arts all people may be classed as producers or consumers, or both. In the case of the producer a knowledge of underlying principles is a necessity; in the case of the consumer theoretical knowledge will often increase the capacity for appreciation. For this reason courses in the history of art are offered, and attendants are provided in art galleries to explain the masterpieces in order to add to the visitor's appreciation of them.

Art in the middle grades. A tardy recognition of the importance of providing proper emotional stimulation has finally led to the introduction of fine arts into the schools. With the coming of the junior high school and the reorganization of the program of studies, opportunity is afforded for exploratory courses. This also gives an opportunity to locate children who may be gifted in different phases of the fine arts.

It is a well-established fact that art studies should be begun in the formative years while the organs needed are most amenable to training. Not only are prospective producers entitled to an early start, but all consumers are likewise more susceptible to the establishment of æsthetic interests in early years. Musical organizations, art clubs, dancing and dramatic clubs, as well as literary organizations, appeal strongly to children in the middle grades. These may be used as means of stimulation for those who are to become producers, as well as sources of æsthetic enjoyment for all members of the school. As one of the fields of knowledge to be cultivated in the middle grades, none should be placed higher than the cultivation and enjoyment of æsthetic relationships.

VII. CHAPTER SUMMARY

In Chapter I an attempt was made to enumerate some of the more prominent physical, mental, and social characteristics of children in the middle grades; in Chapter II the great controlling relationships of man with himself and the world about him have been set forth. Upon these relationships it is proposed to base the work of the middle grades. The relationships of the child to his own body are made the matter of first consideration, because upon the body as a foundation will be built the entire superstructure of personality. The second set of relationships outlined deals with the development of mind through communication with the outside world. Gesture, oral and written speech, with all the forms of pictorial representation, become the tools required for obtaining or expressing ideas and emotions. The third set of relationships presented deals with man in association with his fellow men. These relationships involve the family, the school, the state, the church, and groups of whatever kind. Fundamental principles bind all social institutions together, and the schools must assume some responsibility for developing these principles in children's minds. The understanding and application of economic relationships are made the fourth division of school training. This field includes a consideration of the origin and development of trades and industries, of the production, distribution, and consumption of products, and of the importance of prevocational guidance in the middle grades. Man's relationships with nature are presented as a fifth field of knowledge. Nature as an enemy, nature as a friend or ally, nature as a source of endless treasures, and nature under the control of man furnish the chief topics for this division of the chapter. The sixth and final purpose of the middle grades is to lay the foundation for the proper enjoyment of leisure time, in part through the use of the fine arts. It is believed that these six sets of relationships furnish not only the subject matter for treatment in the schools, but the guiding principles for practical life.

EXERCISES

1. Make a health score card for the use of pupils at home.

2. Select a list of problems that may arise in coördinating health instruction in the schools with conditions and practices at home, and suggest methods for their solution.

3. Discuss the grounds upon which the state may or may not be justified in forcing remedial measures upon the bodies of children in opposition to the will of parents.

4. Explain why we have a comparatively small number of good vocalists in the world.

5. Arrange the different forms of communication in the order of their chronological development.

6. Compare the advantages and disadvantages of teaching foreign languages along with the vernacular in the middle grades.

7. Make a comparison of the social relationships of the early Hebrew family with those of the American family of the present day.

8. Enumerate the social institutions of modern times and select a number of guiding principles common to all.

9. What conditions prevail that make the training in social relationships of special importance to children from nine to fifteen years of age?

10. Make a study of the influence of guilds upon the developments of economic life.

11. Organize the arguments given for placing exploratory courses in the middle grades.

12. Make lists of the effects that resulted from regarding nature as an enemy and regarding nature as a friend.

13. Give the principal causes for the late appearance of the sciences in the middle grades.

14. Upon what grounds may the proposal for teaching the fine arts in the public schools be justified?

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CHAPTER III

MATERIALS IN THE MIDDLE GRADES

I. FORMS AND SOURCES OF MATERIALS

Object materials. Some kind of physical and mental basis capable of development must be assumed; then the matter of presenting the proper stimulations becomes the paramount problem in all education. Mind can be developed only through the presentation of thoughts or things. At first the child's own body and that of the parent determine his mental reactions; with the beginning of a separate existence the senses assume their appropriate functions.

Object materials provide the stimulations for touch, taste, smell, sound, and sight; and as long as the individual lives the objects of the external world will continue to influence the mental processes. Since things precede thoughts, object materials should receive first consideration in any scheme for preadolescent and early adolescent education.

Thought materials. While object materials are of first importance, they are not all-important. Animals come into contact with the object world, but they may not be compared with man, who uses objects as a foundation of a thought world.

As man developed language he began to substitute ideas for objects and so became able to make use of materials not immediately present to the senses. The addition of ideas, or thought materials, to object materials has extended man's capacity for mental development far beyond all other members of the animal kingdom.

Natural and artificial object materials. The use of natural objects in all fields of object materials is very desirable. Not only does the natural object give more vivid impressions, but the dangers of misrepresentation are avoided. The use of natural objects has led to the cultivation of plants, the rearing of animals, the inspection of the heavens, and the observation of the earth. The use of natural objects may compel their removal from original settings, or demand excursions to mountains, streams, fields, or factories.

However, if man were limited to the use of natural objects alone he would, in a measure, be on a plane with the lower animals. So, when natural objects cannot be secured, artificial ones may be substituted. As illustrations of artificial objects we may name casts of bodies or parts; mechanical structures on different scales representing planetary relationships, geological and topographical conditions, and forms of animal and vegetable life; all kinds of machines; and the use of photography, drawing, painting, and sculpture for setting forth images of real things. The introduction of artificial objects has led to the founding of laboratories, museums, art galleries, and countless numbers of man-made models.

Although artificial objects may render large service in mental development, the fact should not be overlooked that natural objects alone reveal true relationships and furnish the foundations of natural laws.

Spoken and recorded thought materials. The stimulation of mind through matter gives rise to ideas. After a time these ideas come to be represented by signs called words or pictures; and the ideas, aroused at first only by objects, later respond to their respective signs. Because of his use of thought symbols man far surpasses all other animals in mental development.

When natural and artificial objects are used to stimulate thought they must be present to the senses, but when objects are represented by symbols they may start trains of ideas regardless of time or location. For ages language was confined to sounds or gestures, and so communication took place only by movements of the body or by word of mouth. Thought materials, as opposed to object materials, were limited by the span of memory. Not until written language was invented was it possible to preserve or to transmit from generation to generation any considerable body of knowledge.

By means of written language, thought materials have been accumulated until no one person can encompass the available knowledge in a single field. In short, the varieties and amounts of both object materials and recorded thought materials have become so great that the proper selection of suitable subject matter for the different ages of children has become a most difficult task; and in no other part of the school system is there a greater need for a complete revision of subject materials than may be found in the middle grades.

II. MATERIALS RELATING TO THE BODY

The body itself. For many years the structure of the body has been a subject of study in the schools. Different states have passed laws making this teaching obligatory. In some cases the laws provide that hygiene shall be taught with special reference to the effects of narcotics on the human system. The passage of such laws has at times been the result of the influences of social reform organizations which did not offer a complete program for health education.

For a long time the structure of the body, rather than its function, care, or development, constituted the subject matter of classroom instruction. But from that movement has developed the present-day proposal to make a thorough knowledge of the anatomy, physiology, and hygiene of the body the basis of a health program that shall reach every child in the entire school system.

Home economics. Since all people demand food, clothing, and shelter, some knowledge of the subject matter of domestic science and domestic art becomes essential to the welfare of every human being. The development of these subjects has gone hand in hand with the movement in health education.

The Federal and state governments have subsidized the teaching of home economics in the schools. This is done in order that the health of the entire population may be sustained. Travel by automobile, camp life, and the development of food and clothing industries have caused men as well as women to become interested in domestic science and in domestic art.

The middle grades should be preëminently responsible for instruction in the elements of home economics. Children from ten to fifteen years of age become interested in foods and dress, and in view of the fact that many will drop out with the completion of compulsory attendance they must get some knowledge of scientific home economics in the middle grades, or not at all.

Content materials of bodily exercises. Gymnastics, play, and games made the Greeks leaders of all time in physical prowess and beauty of form. With the conditions of modern life a renaissance in physical training is the only means of preventing bodily decadence. Conditions of industrial life, modes of travel, ease as a result of increased wealth, overindulgence of appetite, all tend to shift physical activities from the fundamental to the accessory muscles. Unless the loss in basic muscles is compensated through systematic training, the visceral and vital organs will not be sustained, diseases will prey upon weakened parts, and decay will result.

It is impossible to develop muscular control without mental growth. The subject matter of such gymnastic exercises as dancing, swimming, tumbling, running, and jumping; the rules of games and their applications; the history of the origin and development of different activities, with an understanding of their uses in bodily development, — all these provide a vast amount of content materials for mastery.

III. MATERIALS RELATING TO LANGUAGE

Spoken language. The study of language has always constituted a major field in formal education. The great "trivium" — grammar, rhetoric, and logic — originated and developed by the Greeks and Romans has furnished speech materials for two thousand years. But those ancient peoples gave precedence to spoken language: the Greek orator set the standards for speech development; the Roman boy was taken to the Forum that he might be inspired by the eloquence of statesmen. As long as Greek and Latin were living tongues they were studied by direct methods, and so the materials used in the schools were drawn largely from current conditions in life.

Written language. Spoken language, supreme in early civilizations, finally yielded to a study of written forms in the schools of later times. This was in part a natural consequence of the growth of knowledge and the increase of books.

To record thoughts accurately it was necessary to give attention to forms. The development of technical grammar, rhetoric, and logic as formal studies in the schools came from oral application of these subjects in former times.

The greatest impetus to the indirect method of language study came, however, with the Renaissance and the revival of the subject matter of ancient civilizations. The new teachers could not speak the old languages; therefore, the only access to the old materials was through books, and the keys to the books could be secured only through a study of the science of language. This required a laborious study of technical grammar, rhetoric, and logic; thus, the science of foreign tongues became the subject matter of the schools. While the ultimate purpose was the possession of content, the immediate aim was the mastery of form. Later a mistake was made in that when other languages came into the curriculum, filled with the content of new life, the methods and materials of the old civilizations were still retained in the schools and were given precedence over those of the mother tongue.

Spoken and written materials combined. No well-informed person would deny to children the heritage of the past, and no wise leader today would keep from growing minds a knowledge of the language materials necessary to the proper fulfillment of their own pursuits. The development of new fields of knowledge, with the consequent lessening of time available for formal language study, has brought to the program maker a problem of the most serious nature.

While both oral and written forms are used in the pursuit of all subjects, teachers of other than special language studies are inclined to deny all responsibility for language training. In so doing such teachers refuse assistance to their pupils in the formation of language habits in the only way in which a command of correct speech can be secured; that is, through correct usage. Teachers of other subjects force upon special teachers the responsibility for teaching the science of the language while they neglect to require the use of good forms of speech in their own classes.

Good language habits cannot be formed by setting aside one period for the study of forms and then spending the remainder of the day in total disregard of the principles learned.

Much of the subject matter of language instruction arises from the work in other subjects; consequently the laws of habit formation demand that all teachers require good oral and written forms to the end that correct speech habits set up in one field may not be destroyed in another.

Fundamental materials of speech instruction. In the last paragraph it was proposed that all teachers should coöperate in the enforcement of correct language practice. But this will still leave a special field for language instruction. The materials of this field include principles of language capable of practical applications in different subjects. The spelling of lists of words common to all groups of people will leave the vocabularies of special fields to be mastered in connection with the subject matter under consideration. With the correct spelling of common words assured, attention may be concentrated more readily on new words as they appear. In silent and oral reading speed, comprehension, and oral expression may be developed through the use of standardized materials, and the facility thus gained may be made to contribute to the study of all subjects.

As voice is the instrument of oral expression, so is handwriting the means of written expression. Just as the spelling of common words becomes the task of the middle grades, so must a reasonable facility in reading and handwriting be acquired at the same time. The materials of both oral and written composition in the middle grades should be taken from life activities rather than from books. Oral composition should accompany written composition. Where there is interest, thought, and motive, there will be joy in expression.

Just as spelling and writing are essential to written composition, so are the simple principles of punctuation, sentence structure, and paragraph arrangement likewise important. Instruction in these elementary principles of composition should be given by the language teacher, and therefore should be classed as fundamental speech materials.

Another division of fundamental speech materials includes a study of the types, the structure, and the mechanical organization of the different forms of literature. In the past this phase of language teaching was made too prominent in the middle grades; now, instead of stressing form so much, it is proposed to leave more time for the interpretation and appreciation of reading materials.

To summarize, we may say that the spelling of common words, the command of a reasonable facility in handwriting, the use of an economical technique in silent and oral reading, the expression of ideas in reasonably good oral and written forms, and the ability to understand and appreciate simple printed matter constitute the fundamental language materials in the middle grades.

IV. MATERIALS BEARING UPON SOCIAL RELATIONSHIPS

Traditional materials. In every age certain social obligations have been passed from generation to generation by word of mouth. Family relationships, tribal initiations, religious ordinances, and civic offices require certain lines of instruction before vows are taken or obligations assumed. The vows of matrimony, induction into citizenship, confirmation in the church, and the ceremonies used in admission to membership by both open and secret societies include a recitation of the fundamental principles to be observed in these relationships. In some cases, even today, organizations forbid the writing or printing of parts of their ceremonies. This compels their transmission through oral instruction. In the development of races, traditional materials have played a significant part in the formal education of young people; and probably nothing today appeals more strongly to the minds of many pupils in the middle grades than the ceremonial exercises connected with their various organizations.

Recorded materials. When writing came into use, religious creeds and regulations, laws of nations, and the constitutions of social organizations, in common with other growing fields of knowledge, were committed to recorded form. This marked an important step in the development of all social institutions. Before that time misunderstandings and misinterpretations of rights, duties, or responsibilities caused great variation in the administration of all laws. As long as the head of the family, the chief of the tribe, the ruler of the church, or the monarch of the nation was bound by no written laws, the personalities of the individuals in control determined the justice or injustice of the government. With the growth in enlightenment and the increase in the complexity of social institutions, the demand for written laws became universal. Thus recorded laws and constitutions of different types of social organizations became the subject matter of the schools.

Because of the growing command of the tool subjects, reading and writing, because of a wider social contact through the schools and other organizations, and because of the increased radiations of interests caused by physical and mental growth, the middle grades enjoy an unusual opportunity for imparting fundamental principles of citizenship. As in other fields, however, instruction materials in the social subjects have increased with the complexity of social organizations until now the task of making a wise selection has become exceedingly difficult.

The social subjects. Until recently geography, history, and the constitutions of state and Federal governments made up the social studies of the middle grades. In the leading elementary schools of Europe these are blended; in the middle grades in the United States they have been treated largely as unrelated subjects. Furthermore, in an attempt to cover much material unrelated to current social life the more vital phases of subjects were omitted. Too often the books used in the schools were compilations of unrelated facts that neither made appeal to children's interests nor left in their minds the real significance of important social principles.

Recently a complete reorganization of the social subjects has been proposed. This movement originated in a constantly increasing supply of social materials, in a keener realization of the need for social instruction in the schools, and in a recognition of the ineffectiveness of old methods and subject matter. The new plan would eliminate various series of unrelated facts from the geographies, many tables of dates and pages of history not bearing on modern social problems, as well as many details formerly stressed in the study of civil government. In place of outworn or unimportant materials it is proposed to insert the common problems of community life, a study of the organization and administration of modern institutions, biographies of men and women who have made special contributions to human welfare, and those parts of history that throw light on modern social conditions.

Not only is it suggested that a new selection of materials be made, but a new arrangement also is proposed. Instead of assigning geography to one period and history to another, or possibly geography to one year and history to another, it is proposed to arrange a series of social problems embracing the several phases of the social sciences, to be distributed through the grades. According to the new plan geography will be blended with history, and both will be related to the development of fundamental laws of social control.

Concrete social materials. In connection with the study of social problems the following should be examined at first hand: the present-day conditions of population, the practical conduct of government as illustrated in courts and in legislative or civic bodies, the organization and management of industries, and the support and conduct of public institutions. A keen interest in historical problems may be aroused by use of local records bearing on state or national events. Many times landmarks, relics of great social occurrences, original letters or documents, specimens of natural and manufactured products, or reports of eyewitnesses will arouse an abiding interest in civic problems.

No longer do we look to books for all the materials used in social instruction. Nor should we stop with a theoretical use of materials; an attempt should be made through dramatization, through the life of the school, and through community activities to cause the materials used to function, as far as possible, in actual social relationships.

V. MATERIALS RELATING TO ECONOMIC LIFE

Tool subjects and content subjects in economics. While the evolution of occupations from that of the common laborer to that of the merchant prince or the master of industry has covered the entire life of man and has involved a large part of the human race, school training as a preparation for participation in the material world is a matter of recent development. It is true that the large expansion in industrial life calling for a higher grade of technical knowledge has come within the last century. But this fact does not account for the belated introduction of business subjects into the schools. For centuries it was held that training for the trades and industries could be obtained only through empirical methods. The apprentice system was used almost exclusively in preparation for the different pursuits of economic life.

In recent times, owing to the more strenuous competition that results from increase in population, to the development of higher forms in commercial and industrial life, and to a recognition of the value of certain tool subjects, the schools, formerly charged with the preparation for professional life alone, have been called upon to assist with the training for commercial and industrial pursuits. At first economic subjects began to appear in the high schools; today the elements of commercial and industrial materials are appearing as both tool subjects and content subjects in the middle grades.

VI. MATERIALS RELATING TO NATURE

How nature study came into the schools. Although man is constantly surrounded by nature, and his very existence is subject to nature's laws, it required several centuries of civilized life to place nature study in the schools. At first man gazed on the heavens and earth with wonder. They seemed apart from his own being. He looked on animals and plants as sources of food and clothing, but regarded the supply as inexhaustible or beyond his control. He walked on the surface of the earth entirely ignorant of the wealth beneath his feet.

In the intellectual awakening that followed the Dark Ages modern sciences were born, and man began to study his relationships with the world about him. Copernicus upset the Ptolemaic theory by announcing that the earth revolves about the sun; Newton "demonstrated mathematically the motions of the planets and comets, found Kepler's laws to be true, explained gravitation and the tides, made clear the nature of light, and reduced dynamics to a science."[1] Harvey discovered the circulation of the blood, Bacon formulated a new scientific method, and modern astronomy, physics, chemistry, anatomy, physiology, and biology were first applied in mining, metallurgy, and medicine.

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[1] E. P. Cubberley, *History of Education*, p. 388. Reprinted by permission of Houghton Mifflin Company, Publishers.

The sciences first came into the colleges, where they were taught without the use of laboratory equipment. Later they were pushed down into the secondary schools and finally into the lower schools. In the lower grades elements of the sciences came to be known as "nature study."

Book materials. Until recently the deductive method was used for teaching the sciences in all grades of the schools. Indeed, a mere discussion of natural laws without any attempt at application or verification more often prevailed. The very principles that had been derived from a study of nature at first hand by scientists were collected and put into books for the instruction of children, but because of the forms in which they were first introduced into the schools they were not popular with pupils. Later, when laboratory equipment was added, the problems and experiments were made so formal that children still did not become greatly interested in them. In short, textbook materials in the sciences alone, or even when accompanied by illustrations removed from everyday experiences, do not make a strong appeal to the minds of young people. The discovery of this fact has led to a demand for a complete revision of all science materials intended for use in the schools.

Nature materials. Today, instead of starting with books, it is proposed to start with things. Instead of dead things, we are to deal with living things. Before rules will come illustrations. We are to begin with the problems of everyday life and leave for later years a study of the more complex scientific relationships.

The feeding and care of pets or the watering and protection of flowers may be used as starting points for the study of science. Soon gardens, fields, fowls, or domestic animals may be studied as the servants of man. Water in its different forms and uses may be made an interesting subject of investigation. The sources and forms of light and heat in the home may be used as the basis of continued study as children advance through the grades. The development of different methods of locomotion from walking to flying presents many problems of scientific interest. In a sentence, the materials of science suitable to the primary and middle grades must be presented in the forms of practical problems if they are to appeal to young boys and girls.

Phases of nature materials in the middle grades. The first books of modern science were written by specialists and did not deal to any considerable extent with the applications of scientific laws. The several books contained subject matter in certain limited fields. Botany was not related to zoölogy, chemistry was set apart from physics, and astronomy and geology were placed as far apart as the heavens and the earth. In these segregated forms the sciences were first introduced into the schools. According to the psychology of the times and the methods used in other subjects, it was thought proper to teach the principles of the sciences in the schools and leave their applications for later life.

With the coming of a new psychology, the development of industrial life, more practical views regarding education, and a demand for the study of common things, a new procedure was developed for teaching the sciences. It was argued that since children begin early with the study and application of simple facts of language, mathematics, or social studies, and expand their knowledge of these subjects from year to year, the same procedure would apply equally well in a study of the sciences. As a result of this hypothesis the elements of science, known as "nature study," were introduced into the lower grades.

At first nature study was usually followed by anatomy, physiology, and hygiene, or by physical geography. The tendency in many schools today is to eliminate the old form of physical geography by putting general science in its place. For the pupil ten to fifteen years of age the following phases of science study are now advocated: nature study; structure, functions, and care of the body; general science, including the elements of biology as applied to plants and animals; industries and household economics. Instead of studying a single science at a time, phases of different sciences are applied to the solution of life problems.

VII. MATERIALS RELATING TO ÆSTHETICS

Natural materials of æsthetics. Æsthetics has been defined as "the science of the beautiful in nature and art." This definition suggests two types of materials to be used in the establishment of æsthetic relationships: the natural and the artificial.

Just how far back in the animal kingdom appreciation of æsthetic relationships may be traced, it is impossible to determine. Whether or not birds appreciate the colors of their own plumage or the music of their own songs, to any considerable extent, is a matter of speculation. Whether or not animals experience emotions kindred to our own in the presence of music or when looking upon colors and forms is open to question. But certain it is that in the lowest types of human beings definite signs of appreciation of related forms, colors, and sounds are unmistakable indications of ideas of æsthetic relationships.

Not only in savages but in the insane and simple-minded we find indulgence in the æsthetic arts. Blind Tom, an adult negro of such low intelligence that it was necessary to treat him as a babe, sang and played the piano with remarkable skill. The well-known passion of the insane for dancing reflects unquestionable appreciation of harmonious sounds and movements. But while the appreciation of æsthetic relationships may be found among savages and feeble-minded persons, the development and enjoyment of the fine arts are rated among the highest achievements of civilization.

Free as the air we breathe, nature has spread before us a wealth of natural materials for the enjoyment of æsthetic relationships. Multitudinous forms, the most gorgeous colors, and endless varieties of musical sounds meet us on every hand. The rippling of water, the coloring of the skies, the shades and tints of landscapes, the sighing of winds, the lowing of herds, and the singing of birds combine to develop in man a higher and still higher appreciation of the beautiful.

Artificial materials of æsthetics. Since man cannot visit all parts of the world and thereby view all objects possessing beauty, or carry with him without loss the memories of scenes visited, he makes more or less satisfactory copies or pictures which not only refresh his own memory but may convey to others who have never seen the originals some idea of their real beauty. Drawing, painting, and modeling were developed for the purpose of producing artificial representations of natural objects. Music and poetry copy and expand the rhythms found in natural cadences, and dancing gives expression to pleasurable emotions through rhythmic movements of the body.

It should be noted that while natural forms, colors, sounds, and movements furnish the bases for the fine arts, man has carried his skill beyond the task of mere reproduction and, through his imagination, has originated additional forms of beauty. Among these architecture, the higher forms of music, designs for landscape and household embellishment, songs and poetry, may be named as illustrations.

It is now generally agreed that the middle grades should locate talent and give elementary training in the fine arts. Both natural and artificial materials should be employed. Kodaking, drawing, modeling, painting, singing, playing, and æsthetic dancing will furnish materials; while exhibitions, entertainments, adornment of buildings and grounds, competitions among classes or schools, and the pure emotional enjoyment of production may be used as means for motivating the work.

VIII. CHAPTER SUMMARY

All subject matter may be classified, with regard to form, as object materials or thought materials; with regard to sources, as natural or artificial products. Thought materials may be transmitted by word of mouth or through signs and symbols. Object materials furnish the basis of thought materials, and natural materials provide the patterns for artificial products. When symbols were substituted for spoken words the progress of the human race was given wings.

The one absolute prerequisite of a mortal mind is a natural body. The efficiency of the body, from conception to dissolution, conditions the development of capable mentality. Consequently the structure, function, care, and improvement of the body should be given first attention in every system of education. Certain developments of modern life tend to destroy physical efficiency. Food, rest, exercise, and proper remedial measures are the only means for preventing physical decadence. Knowledge and use of the principles of anatomy, physiology, hygiene, home economics, manual arts, and physical exercise provide the materials for establishing proper bodily relationships in the middle grades.

While the body mediates mind and the external world, language is the greatest instrument of communication. Oral and gesture languages preceded written forms in early civilizations, yielded to book materials in the schools for some hundreds of years, but now again claim due recognition in the schools. The language materials of the middle grades include spelling, handwriting, silent and oral reading, dramatization, oral and written composition, and the interpretation and appreciation of suitable literature.

Training in social relationships has passed through three different stages. At first the older generation instructed the younger directly by word of mouth. When recorded materials became available, formal instruction appeared in the schools. Now it is proposed to use phases of geography, history, sociology, anthropology, and the science of government as means for solving the vital problems of daily life.

In gaining control of economic relationships certain tool subjects are required. Among the more important of these the following may be named: arithmetic, business English, letter-writing, commercial forms, bookkeeping, stenography; on the more mechanical side, typewriting and the use of adding machines and filing systems. Content subject materials include knowledge of occupations, and economic principles applied to the production, distribution, and consumption of such common articles as fuels, food, clothing, shelter, all of which principles are to be acquired, as far as possible, through a study of natural situations.

Hundreds of years of civilized life were required to bring man to an intelligent appreciation of his relationships to natural laws. At first the sciences appeared in the higher institutions, but were gradually pushed down until they have now reached the elementary schools in the form of "nature study." The subject matter formerly consisted of a study of abstract principles with little reference to application. More recently book materials have been supplanted or supported by natural materials. Nature study, the structure, function, and development of the body, general science, elements of biology and agriculture, provide the science materials of the middle grades.

Appreciation of æsthetic relationships appeared among the lower types of the human race. Not alone do normal minds respond to different forms of æsthetic enjoyment, but subnormal minds as well. Natural materials based upon form, color, and rhythm first aroused æsthetic responses and then became the bases of works of art. The race has not been satisfied with a mere reproduction of existing models, but has applied principles found in nature to new creations in architecture, higher forms of music, home and landscape decorations, and dramatic art. The subject matter of the æsthetic arts taught in the middle grades includes elements of drawing, painting, modeling, different forms of music, dancing, and dramatics.

EXERCISES

1. Classify phases of the subjects taught in the middle grades as object or thought materials and as natural or artificial products.

2. Make a list of practices tending to destroy physical efficiency that have arisen in modern or civilized life.

3. Organize the principal arguments *for* and *against* the assertion that all teachers should be language teachers.

4. Secure spelling books, grammars, or rhetorics published fifty years ago and compare them with similar books in use today as to subject materials included.

5. Compare the materials found in earlier geography, history, or civil-government textbooks with those found in similar books now in use.

6. Make a list of institutions that are furnishing new subject materials in the social sciences at the present time.

7. Distinguish between tool subjects and content subjects and classify the different economic subjects taught in the middle grades under one or the other of those headings.

8. Contrast the types of materials proposed for exploratory courses in the middle grades with the materials of vocational courses offered in the technical high school.

9. Suggest science materials found in the home, on the farm, or in the industries that may be used in teaching pupils from nine to fifteen years of age.

10. Make a comparison of the relative values of natural and artificial materials for teaching the fine arts. List the principal sources of fine-arts materials.

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CHAPTER IV

FORMS OF PROCEDURE IN TEACHING

I. THE USE OF THE PROBLEM

The location of problems. All problems arise from bodily, linguistic, social, economic, intellectual, or æsthetic needs. Needs may be immediate, intermediate, or indefinitely remote. Immediate needs command active attention and arouse persistent interest. The satisfaction of needs through the application of attention and interest becomes the cause of all mental activity. Since needs vary widely in variety, intensity, and order of immediateness or remoteness, an innumerable array of problems constantly confronts the awakening or awakened mind.

The origin, value, and immediacy of the problem determine the activity manifested in its solution. With young children problems arising from such wants as hunger, bodily movements, manipulation, or curiosity are immediate, and so command keen attention and profound interest. As the child becomes older, needs for larger companionship, control of external conditions, or preparation for future activities present an ever-increasing list of problems. Problems arising from all fields of human relationships become meaningful to growing minds and challenge every resource available for their solution. Successful instruction will depend upon the teacher's ability to locate problems in the instinctive or acquired needs of children and to make their solution a matter of intense interest to those concerned.

Kinds of problems. Problems differ in form and extent according to their sources and uses in the control of relationships. They may arise from the fundamental desire to sustain life; for example, the problems of food, clothing, shelter, avoidance of disease, or increase in physical efficiency. They may appear in connection with the effort to satisfy the need for the communication of thought. The necessity for the establishment of social relationships yields an interminable variety of problems for solution. The production, distribution, and consumption of wealth present problems that have called into service the highest inventive powers of genius. Man's conflict or coöperation with nature's laws calls for the constant operation of thought processes. The ever-increasing appreciation of the beautiful, as the mind reaches higher levels of development, is a result of the solution of larger and larger problems of æsthetic relationships. Because of certain similarities in form, problems arising from similar sources have been thrown into groups which we call languages, mathematics, sciences, and so on.

Not only do problems differ in form as a result of their sources or uses, but they also vary indefinitely in extent and complexity. Since problems differ so greatly, their solution may be brought about in many ways. A king desiring to quench his thirst may ask whether the proffered cup contains water or poison. The answer may be given in a word by the servant who drew the liquid from the fountain, or a chemist may be called to analyze the contents of the cup. Thus in every field of human need many problems may be resolved on authority, while many others require the most careful and extended analysis.

The importance of the relative simplicity or complexity of problems should not be overlooked in the arrangement of subject matter for the schools. The determination of the name of a reasonably familiar object and the study of the origin and development of the earth present problems of entirely different rank. Since variation in extent and complexity of problems prevails in every field of relationships, the arrangement of school materials in proper sequence becomes one of the most difficult tasks in formal education.

Definition of the problem. The location of a problem in an instinctive or acquired need, the direction of attention, and the development of interest in its solution are necessary steps in instruction. But it will not be possible to accomplish an economical solution until the problem is clearly defined. The practical problems of everyday life as well as the artificial problems found in the textbooks are often vague or poorly defined. The physician must locate and define the disease before he can prescribe a suitable remedy; the lawyer must set forth the points of his case before he can apply the appropriate statutes; the mechanic must determine the exact trouble before he can repair the broken parts; likewise the learner must be able to set forth in clear terms the limits of the task to be performed before the work can be properly accomplished.

Because of the bad methods used in teaching, such as the slavish use of textbooks or the memoriter system of study, children often fail to realize that subject materials are not ends in themselves. They may accumulate materials, but they seldom locate, define, or solve the involved problems. These observations do not apply to children alone, for the author has noted repeatedly that when college students are requested to make up a series of problems in their own major subjects they are often quite unable to meet the requirement in a satisfactory manner. The recognition and definition of problems is a lifelong task which, in common with other forms of learning, should receive attention from the very beginning of school life.

The solution of the problem. The nature of the problem will determine the steps of procedure required in its solution. In general, the purpose of every problem will be to develop some principle or to apply some general rule to a special case. The former procedure is called induction; the latter, deduction.

In induction, or in the search for general principles, certain definite steps have been proposed. These include (1) preparation, or the arousal of interest necessary for the consideration of the new problem through a review of facts already learned; (2) presentation of facts which contain common elements; (3) comparison of facts in order that common elements may be selected; and (4) the formulation of the principle derived.

In the so-called deductive process the purpose is not to lead to some general law but to use general laws for the determination or classification of special cases. Here the procedure will be (1) location and definition of the particular case; (2) recall of some general rule; (3) formation of an inference that the case under consideration falls under the general principle recalled; (4) verification of the inference or hypothesis assumed.

In the practical solution of problems one or more of the formal steps may be abbreviated, rearranged, or eliminated entirely from the procedure; or deduction may become a part of induction. To illustrate: in induction the review of known facts may be omitted or may be mingled with the new; comparisons may be made as additional facts are presented, blending steps 2 and 3 of the inductive process; or tentative conclusions may be set up from two or more cases and then abandoned, modified, or strengthened as further cases are examined, in which case steps in deduction are intermingled with steps in induction. Although inductions are never complete and deductive inferences may not be fully verified, these general procedures are used in the solution of all problems.

In the solution of the problem certain definite procedures or forms of attack contribute to economy of time, facility in manipulation, and certainty of success. The selection of essentials, a command of efficient systems of manipulation, and the attainment of skill in the application of systems chosen are primary factors in effective thinking.

The selection and definition of the problem, the analysis of its component parts into known and unknown, the recall of experiences and principles, the comparison of facts with facts or of facts with principles, the formation of inferences, tentative hypotheses or conclusions, the comparison of further facts with tentative conclusions, and the verification of inferences or hypotheses are factors to be observed. Admission of all the facts available, unwillingness to rush to hasty conclusions, and the progressive use of points satisfactorily determined, all make for success in problem-solving.

II. THE SELF-ACTIVITY PROCEDURE

The self-activity method. Learning implies self-activity. Teaching can contribute to self-activity only by supplying materials or helpful conditions for its exercise. The self-activity method is the one used by the individual in teaching himself; indeed, all other methods are subordinate to it. It is used by the newborn babe in its first explorations in a new world, and it is used by the scientific investigator who seeks to solve the mysteries of the universe. All the vast army called teachers, all school buildings with their equipment, all books of instruction, all moneys provided for educational purposes, and all laws bearing upon educational control exist for no other purpose than to assist individuals in obtaining the largest possible self-realization. The purpose of formal teaching, then, should be to stimulate the child to self-activity in learning and to place about him such conditions as will ultimately enable him to dispense with the teacher's services.

Educational leaders of different centuries have advocated freedom for the child in learning. Rousseau, Froebel, Armstrong, Dewey, Montessori, and Parkhurst have proposed systems looking to the emancipation of children from an external school bondage. Each of these writers has made some contribution to the self-activity method of learning. Rousseau in his demand for a natural life for children, Froebel in his kindergarten, Armstrong in calling upon the schools of England to permit children to teach themselves, Dewey in his Chicago school, Madame Montessori in her Italian school, and Miss Parkhurst in the Dalton plan have had the same purpose in mind — freedom for the child.

This demand for reasonable liberty in learning is heartily commended, but absolute freedom may destroy the desirable ends of education. Just as the traveler in the desert may need a path or a guiding star, nourishment or perhaps encouragement, or at the end of the journey a beacon light, so will the child in an untried world need stimulation, direction, and assistance. To meet these needs various forms of procedure for assisting pupils in their studies have been devised.

III. DEMONSTRATION AND IMITATION

Basis for the demonstration method. Methods in the schools are frequently copied from the methods used in practical life. When the small child cannot solve a problem, it runs to the mother, who shows it how to untie the knot or manipulate the toy; later she demonstrates the steps in the preparation of food and clothing. In the same way, in early times the boy was taken on the hunt, into the fields, or to the shop, that he might see his father perform his accustomed tasks. Children learned by imitation of others to perform the common duties of daily life. With the division of labor well-defined trades were established. Soon a certain amount of technical knowledge was required for a given trade; and in order to transmit this information the apprentice system of teaching was developed.

The apprentice system in the professions. It must not be understood that the method of instruction used in the apprentice system has been applied to the trades only; for when the learned professions arose, the same procedure in teaching was invoked as that which prevailed in teaching the manual skills. The prospective minister first learned the church ceremonies, official duties, or responsibilities through observing their performance by experienced persons. In former times the prospective lawyer entered the office of some successful practitioner; but in addition to studying books, he attended court for the purpose of observing the conduct of trials by skilled attorneys. So, too, one who expected to become a doctor was admitted to the company of some experienced physician who permitted the neophyte to attend him and to observe the treatment of cases. And while economies in time have been effected through the addition of supplementary methods, procedure by demonstration still remains a major method of instruction in all fields of practical life.

Demonstration in the schools. Much of the demonstration work in teaching, formerly available only in practical life, has now been taken over by the schools. Divinity students are gathered together in theological seminaries where they observe demonstrations by experts; law students participate in moot courts with their instructors sitting as judges; medical students attend clinics to observe the performance of surgical operations.

Until recently the entire preliminary training of all teachers was received by means of the apprentice system; that is, they imitated the procedures of their own former instructors. Now teachers' colleges maintain demonstration schools for the specific purpose of exhibiting to prospective teachers or to teachers in service the best forms of procedure in teaching.

Attention should be called to the fact that teachers in an effort to demonstrate methods of procedure are prone to do too much of the work, thus relieving the learners of responsibility. Valuable as this method may be, it is fraught with certain dangers, since it may be used to excess or without due regard for the pupil's part in the work. Sometimes the demonstration may set a rigid pattern that robs the learner of originality and initiative; or again the teacher may do a major part of the work and fail to require of the learner sufficient application of the principles demonstrated by the instructor.

In a previous paragraph attention was called to the wide use of the demonstration method of teaching in professional fields. It now remains to be shown that this method is also used extensively in connection with instruction in various school subjects.

In oral reading, in writing, and in dramatic expression, instruction by demonstration has always been given prominence. The proper position of the book in reading, of the pen in writing, or of the hands, arms, and body in dramatics may be learned by imitation. The elements of all games of skill, the manipulation of instruments used in the fine arts, — in short, all movements of the body required in either the arts or industries, — may be taught in part by use of the demonstration method.

But although the demonstration method is more applicable to those subjects that deal with some form of physical expression, it may also be used with subject matter belonging more especially to the thought processes. In mathematics, for example, the teacher may solve a problem step by step in the presence of the class; in teaching language a paragraph may be constructed or the form of a letter may be built up showing proper procedure in the use of language principles. In the teaching of physical sciences demonstration has always played an important part. The great trouble in teaching the languages or the exact sciences is that the teacher may use the demonstration method to excess, thus depriving the pupils of the opportunity for the exercise of initiative or self-expression.

In spite of the dangers involved in the use of the demonstration method, it may be said that the teacher of reading should be able to read, that the instructor of musical instruments should be able to demonstrate their uses, that the coach will inspire more confidence if he can play the game, that the instructor in the manual arts should be able to use the tools, and, finally, that the teacher of teachers should constantly exemplify the fundamental principles of the art of teaching. For we become like those we admire, as did Ernest in "The Great Stone Face." The intonation of the teacher's voice, his gesture, his forms of speech, his methods, will be imitated.

In no other period of life is the individual more susceptible to the influence of example than while passing through the middle grades. Demonstration is more than an abstract procedure in instruction: it may become the final test of understanding, the true exemplification of relationships, or the highest manifestation of personality in teaching.

IV. THE VERBAL METHOD

Verbal instruction. The race began to make great progress when it was able to add verbal instruction to experimentation and demonstration. It then became possible to give directions and explanations that might be carried out at later times or in other places. This also freed the learner from slavish imitation, since it enabled him by means of a few appropriate suggestions to use his own ingenuity in the solution of problems.

With the addition of the "telling" method we complete the basic procedures in all learning and teaching. The three fundamental types of teaching are (1) self-instruction through exploration, experimentation, and investigation, (2) instruction through demonstration, and (3) instruction by means of verbal communication.

Oral instruction. Although oral instruction prevailed for untold centuries before written instruction was invented, it continues to be an accompanying procedure for all other methods of teaching. Although oral instruction is subject to certain limitations inherent in the use of language, it possesses the advantage of reflecting the stimulating influence of a living personality. The baneful effects issuing from a colorless or incompetent personality should be charged to original endowment or lack of training rather than to the method of instruction, for every method known may fail in the hands of a lifeless or incompetent teacher.

Oral instruction has often broken down because of a failure to recognize the fact that, in teaching, a vital relationship must exist between the minds of the teacher and the one taught. The failure to observe this relationship has resulted in two forms of wasteful procedure: on the one hand the teacher may do all the talking by using the telling, or lecture, method, and on the other hand the child may be required to do the telling, or lecturing, which results in what is generally known as the recitation method. In either case the results are unknown; for when the teacher lectures, the pupils may not heed or understand him, and when the pupils recite, the teacher will not always know that the words spoken are understood by those who utter them.

When the weaknesses of the lecture and recitation methods became evident, an attempt was made to correct the evils observed by the use of questions and answers. From the time of Socrates, perhaps the greatest questioner of early times, until the present day the question-and-answer method has played a conspicuous part in formal instruction.

After a time, however, it was discovered that the question-and-answer procedure also was subject to serious limitations. Questions were poorly formulated. They might be too numerous, too superficial, or too obscure. The answers might be suggested by the questions or they might be recited without understanding. Time was wasted, results were unsatisfactory; so again it became necessary to seek means for the improvement of oral instruction.

The next step in the development of oral instruction led to the introduction of the discussion method. This mode of teaching possesses certain very definite advantages. In the first place, it may make use of all other oral methods already discussed. It also places responsibility for instruction equally upon all concerned. The pupil may call for further elaboration of the teacher's statement or the teacher may challenge the pupil's understanding of the answer given. Better personal relationships may be established, greater concentration be secured, and a clearer understanding of difficulties be developed through proper use of the discussion method. The discussion method, as was previously suggested, is a composite of different forms of oral teaching; but it adds the factor of vital intercommunication.

Written instruction. With the development of writing, those who committed their knowledge to recorded form became able to teach not only strange peoples of other lands but untold generations still unborn. Written language has become the conservator and purveyor of all forms of knowledge, the teacher of all literate beings. Books, in common with other instruments for teaching, possess both advantages and disadvantages.

Among the advantages of written language is the large opportunity offered for self-instruction. Books may be treated with perfect impunity in any manner the learner may choose. They know no social distinctions, but offer their contents with impartial interpretation to all alike. They are constant, for when questioned again and again they repeat the same story.

Books usually represent the sincere and matured judgments of their authors. They sometimes enjoy undue confidence merely because their contents are presented through printed pages. Some people seem to be eye-minded, and for such persons written language furnishes a better instrument for learning than spoken language.

Instruction through written language also has certain disadvantages. It lacks the glow of oral speech and cannot adapt itself to individual differences. It plays a dictatorial part, for it does not admit of rapid intercommunication. It uses the lecture method almost entirely; since when it is forced to yield to a question-and-answer form, it complies by reducing instruction to a mechanical procedure. Exchange of ideas by means of written language is a slow procedure that is seldom used in class instruction except in examinations or in formal exercises.

Uses of books in teaching. Since books contain the world's supply of crystallized knowledge, they become valuable instruments of formal instruction in all subjects. When the supply of books became more plentiful a tendency to withdraw from oral methods of instruction and to depend more upon recorded subject matter became popular. The memoriter system of learning became widespread. Instead of using books as servants they were allowed to become masters of instruction.

Books soon became the foundation of the recitation method, and materials outside of books were neglected. But by and by the inordinate deference to the past became dissolved, and for some years a new interpretation of the meaning of education has been demanding a revision of both book materials and book methods. The teacher again is called upon to become the master of instruction, to mingle recorded with unrecorded subject matter; in short, to apply more inspiring methods in the use of books. In accordance with this new demand books have been classified and their several uses have been more fully determined. We have at last learned with Bacon that "Some books are to be tasted, others to be swallowed, and some few to be chewed and digested."

The term "books," as used here, is intended to cover all forms of written or printed materials. Drawings, maps, charts, and pictures have been made parts of books, thus becoming basic or supplementary to verbal materials. These often present meanings more vividly and more economically than words, thus becoming highly valuable means of instruction.

It may be said that verbal instruction, oral and written, constitutes the most widespread means of teaching today. Many variations designated as the telling or lecture method, the question-and-answer method, the discussion method, the book method, as well as various combinations of these, are now used. Finally, the verbal method of instruction may be used in connection with all other methods in the study or in the teaching of all fields of human knowledge.

V. PROCEDURES WITH OBJECTS

The return to natural materials. The different views with regard to the meaning of education have from time to time determined the materials and methods used in instruction. In early days man was in constant contact with nature, so nature became his teacher. Food was secured from woods or streams, and clothing was transferred from the backs of animals to the backs of men. The sun and moon, snow and rain, birds and animals, trees and plants, winds and storms, rivers and oceans, occupied his thoughts by day and, doubtless, filled his dreams by night. All races, the world around, were at first compelled to learn from natural objects. With the introduction of books symbols were substituted for things; then the schools began to talk *about* objects instead of *using* objects themselves. As Dr. W. T. Harris once pointed out, the educational pendulum swings back and forth from the concrete to the abstract. In like manner the schools have moved from a study of things to a study of words, then back to a study of things.

The return from scholasticism to realism did not at first effect a complete reinstatement of objects in learning. Comenius proposed to educate the child, in part, by means of a picture world. This proposal constituted a significant contribution to methods of instruction. But pictures are merely shadows of things; so Rousseau and Pestalozzi soon called for real things.

For the child, however, this proposal resulted only in an intermediate step, since the teacher was inserted between the object and the learner. The method of demonstration, which we have already discussed, became popular. The teacher manipulated the objects, and the pupils observed the demonstrations. Laboratories filled with lifeless objects or artificial machines were set up, and thus another step in the return to the use of natural objects was taken.

But the cycle was not yet complete. Learning had begun by means of direct contact with objects themselves; next they were studied by means of words or symbols; then followed pictorial representations; in turn came the introduction of lifeless or artificial materials; then, finally, came the demand for the use of natural objects as a means for instruction.

Object materials and their methods. In all forms of instruction, methods have their foundations in the materials to be used. As materials differ, so must the processes of teaching be modified. If the materials are traditional, methods inherent in spoken language must be applied; if the subject matter is recorded in books, modes of instruction suited to the proper use of written materials should be used; when object materials are to be employed, the appeal should be made through the use of objects themselves.

The return to object materials has extended the walls of the schoolroom to include all of nature that can be brought into contact with the senses. Objects may be visited in their natural settings or they may be collected and subjected to laboratory conditions.

The wide variation in object materials and in the conditions under which they may be studied gives opportunity for the exercise of many native tendencies. Roaming the fields, collecting specimens, visiting factories, manipulating machines, cultivating plants, working with animals, handling foods, making clothing, all give opportunities for the use of the basic methods of teaching. Object materials appeal directly to such fundamental phases of the original nature of a child as curiosity, hunting, collecting, hoarding, manipulation, construction, and mastery, which are the mainsprings of self-activity that lead to self-realization.

Object materials, in addition to making direct appeal to the senses, lend themselves to other basic types of teaching. The investigation method, the manipulation or demonstration method, the descriptive or verbal method, the organization or classification method, the drawing or representation method, the experimentation or laboratory method, and the practical or project method, all may be used in interpreting the relationships of the parts of the object world.

Object materials and the project method. Recently a new term, if not a new type of teaching, has been popularized in connection with instruction procedure. Project teaching is defined by Stevenson as "a problematic act carried to completion in its natural setting." [1]

As discussed by Stevenson, this type of teaching would deal largely with object materials. Other authors would extend the project to apply to thought materials as well. Regardless of the extent to which this type of instruction may be carried, it is certain that it is clearly applicable to the manipulation of the object world. Furthermore, it sets up an aim that may be understood by the pupil. While the project method includes elements of other procedures in teaching, it makes the task meaningful and directs effort toward some definite end.

Object materials in different subjects. A return to object materials not only brought laboratories for the physical sciences into the schools, but it also affected in a remarkable way the materials used for instruction in the humanities. In teaching the languages not only are the names of things presented to the pupils but, so far as possible, objects themselves are brought before the learners. In the social sciences, institutions are visited and studied while in actual operation. Elementary mathematics, formerly taught in a purely theoretical manner, is now applied to the practical problems of the object world. In the field of the fine arts living models play a conspicuous part. In short, objects in their natural settings, with direct methods of physical contact, are now being reinstated in their original relationships in the scheme of education, and the good effects are becoming evident in the appearance of better methods of instruction in all school subjects.

[1] J. A. Stevenson, *The Project Method of Teaching*, p. 43.

VI. PROCEDURES IN DIRECTED STUDY

Importance of self-activity in learning. The part of the teacher in the educative processes will always depend to a considerable extent upon the psychology of the times. When the mind was considered a mere receptacle to be filled, the teacher was expected to select the materials thought best for the child and to force them upon the mind with a complete disregard of the pupil's interests or desires. External control along with the didactic method of teaching was then supreme. The part of the pupil was to receive the message and repeat it word for word. The message might be delivered in the form of a lecture or it might be taken from a written or printed page, but the form of the recitation was the same. The memoriter system prevailed.

With the introduction of genetic psychology a complete revision of materials and methods was made necessary. The original nature of the child became a paramount factor in determining the laws of learning. Native endowment and individual differences, biological and psychological propensities, instinctive and acquired interests, immediate and remote purposes, and, among other considerations, the self-activity of the pupil became significant factors in the modification of the teacher's part in education. Instead of performing the skills and thought processes for the child, the teacher was called upon to apply his energies to the end that pupils might perform the skills and thought processes for themselves. This procedure has come to be known as directed study.

" From 'Possum Kingdom to Pueblo." When Superintendent Search proposed to return to individual instruction in a Colorado school system some years ago, Arnold Tompkins[1] stated that the starting point had been reached, that we had completed the circle "from 'Possum Kingdom to Pueblo." He used the 'Possum Kingdom School to typify primitive conditions when each pupil was treated as a separate unit in school instruction.

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[1] *School Management*, p. 114.

After the régime of individual instruction of earlier times came the classification and grading of pupils. The change from individual to mass instruction was a result partly of economic conditions but partly of a faulty or inadequate knowledge of child psychology.

The grading system led to certain mechanical forms of instruction. The enlargement of groups or classes resulted in the submersion of the individual in the mass. The lock step in promotion, resulting in the failure of weak pupils as well as the retardation of the strong, caused the elimination of large numbers of pupils from the schools. The weaknesses of the grading system with its methods of instruction, the development of a new psychology, and a revision of the fundamental aims of education finally led to a demand for a change from mass instruction.

The ever-increasing school population, the growing appreciation of individual differences among children, and a better understanding of the laws of learning have resulted in a partial return to individual instruction. The procedure in teaching now proposed is usually denominated supervised or directed study.

Difficulties in directed study. In the attempt to make the transition from a mechanical to a psychological basis of instruction many difficulties have been encountered. School materials have not yet been formulated to meet the new type of procedure; methods and technique have not been developed for the different subjects; and many teachers are not prepared for the change. Conditions, however, are not without signs of substantial encouragement. Subject materials are already yielding to favorable revision, as shown in modern textbooks; procedures suited to the different subjects are being developed; and teachers are taking their positions as stimulators, guides, or assistants in the libraries, laboratories, and study rooms. The position of the teacher is being changed from the front of the room to the side of the pupil.

In directed study the problem must first be developed in the mind of the pupil so that a definite need for its solution is felt. When this point is reached, the pupil may solve the problem without assistance, or the help of the teacher may be required to speed him along. The new procedure does not contemplate the elimination of the fundamental principles underlying the old methods, but it does mean their better adaptation to teaching needs. There will still be need for experimentation, demonstration, questions and answers, and manipulations of materials. The chief difference will consist in shifting the largest possible responsibility from the teacher to the child.

Just as it is often more difficult to get others to perform physical tasks than to perform them alone, so is it sometimes with mental performances. In the past the teacher has often done too much of the work for the pupil. Experienced teachers may find it more difficult to apply the new method of procedure than to continue the old.

It is safe to say that before complete success in directed study can be attained subject materials must be reorganized, special technique for the different subjects must be developed, and teachers must form new sets of habits. However, the movement for directed study has gained considerable momentum. Books on supervised or directed study are coming from the press, valuable experimentation is now in progress, and already much good has been accomplished.

VII. PROCEDURES BEST SUITED TO THE ESTABLISHMENT OF DIFFERENT SETS OF RELATIONSHIPS

Obtaining command of health relationships. The establishment of proper health relationships in young people is largely a deductive process. It requires the application of health principles to individual cases under controlled conditions in order to gain general health protection. The child is not expected to experiment with diseases, with improper diet, or with physical abuse in order to establish hygienic habits; consequently he should learn sets of principles that govern the control of food, clothing, posture, growth, rest, and exercise. These principles will include knowledge of structure, function, and uses of the several organs. Laws governing preventive or remedial measures necessary for the control of common diseases should receive attention.

The procedures for teaching the laws dealing with health habits may include books, lectures, discussions, or illustrations drawn from practical life. The principles, however, must be applied to proper habit formation. Here the procedures will include self-activity, demonstration, use of objects, and directed study.

Learning language control. In teaching language control to children the inductive-deductive procedure should be used. Oral speech should be given precedence over written speech, and illustrations should generally be used before rules. Demonstration and imitation also play an important part in teaching and learning language control.

The use of life experiences furnishes the best means for securing verbal expression. Dramatic representation gives opportunity for the development of interpretation and self-expression. The use of language in securing ideas from the printed page requires, of course, the employment of a wide use of books containing many kinds of printed or pictorial materials. Special devices for the teaching of silent reading, appreciation, oral or written expression, spelling, and handwriting become necessary.

Teaching social relationships. When the materials dealing with social relationships are wisely selected they lend themselves to a great variety of types of procedure. Self-activity may be applied to original investigation of local problems, dramatization may be used in connection with the study of social organizations, the different types of verbal procedure are almost constantly employed, the use of object materials may add a realistic glow to the study, and many of the problems in the social sciences yield especially well to directed study or to practical application in the form of projects related to everyday life.

Teaching control of relationships of economic life. The subject matter in economics proposed for the middle grades makes a strong appeal because theory may go hand in hand with application. Furthermore, all the basic procedures of instruction may be used in presenting the different phases of the subject materials. Since the problem may be a study of some occupation or industry, the manipulation of a typewriter, the use of tools in the construction of a given product, or the arrangement of forms for handling simple accounts, plenty of opportunity will be afforded for personal initiative on the part of the student. Demonstration and imitation may be used in teaching certain parts of the work. The projects undertaken will furnish constant demands for the best method of supervised study. Finally, the freedom of movement and the intimate relationship between teacher and pupils give ample opportunity for the use of the best methods of intercommunication or socialized study in teaching the fundamental principles that deal with economic life.

Acquiring knowledge and use of natural laws. In studying natural laws we again have need for various types of procedure. The use of object materials, the inductive and deductive processes, the problem and project procedures, the verbal and demonstration methods, theoretical and empirical presentations, self-activity and external guidance, all blend in the study or application of nature's laws. Books or machines, as well as natural objects, may be made to contribute to an understanding of the sciences.

Books represent the telling or didactic procedure, laboratories furnish opportunities for demonstration, experimentation, or verification, and natural objects present fields for the application of laws learned in books or in laboratories.

By the use of different procedures the teachers of the sciences will be able to arouse deeper interest and greater activity on the part of the pupils.

The development of æsthetic powers. Of all fields of human relationships the fine arts provide the most unlimited opportunity for emotional appreciation or self-expression. While artists are undoubtedly gifted beyond their fellows in their respective lines, they nevertheless profit greatly from instruction in the mechanical phases of their different fields. The prospective painter will need instruction in the mixing of colors, the future sculptor will be aided by an early study of forms, the architect must learn the principles of drawing, the musician must be drilled early in the use of the voice or in the manipulation of musical instruments, and the poet must learn the mechanics of language.

Methods for teaching the elements of art appreciation or art production include the analysis and synthesis of forms, movements, colors, and sounds. Explanation, demonstration, imitation, manipulation, direction, and experimentation are all-important procedures in learning and teaching æsthetics.

VIII. CHAPTER SUMMARY

The problem is given first consideration because of its importance in the establishment of all desirable relationships. Problems arise in definite bodily, linguistic, social, economic, intellectual, or æsthetic needs. They vary in extent from a desire to satisfy some simple passing curiosity, through all the different needs of daily life, to an attempted solution of the origin of life itself. The variety of problems is accompanied by varying degrees of simplicity or complexity.

The successful solution of problems will depend upon clear definition, orderly arrangement of known and unknown parts, careful selection of relevant factors, ability to relate cases and principles, open-minded dealing with all related ideas and evidences, and the announcement of conclusions or verifications in their simplest terms.

The highest type of procedure in all learning is based upon self-activity. In this procedure the learner strives to become his own teacher. This method leads from aimless manipulation by the babe to independent investigation by the scientist. In this type of procedure all external provisions are organized for the purpose of enabling the child to reach a higher degree of self-instruction.

Animals are able to go little beyond instinctive actions; human beings imitate their fellows. This capacity called into existence the showing, or demonstration, method. It was this method of instruction that became the foundation of the apprentice system of teaching. Later this procedure was used in preparation for the learned professions; more recently it has been taken over by the schools. Today demonstration and imitation play a conspicuous part in all fields of worthy endeavor.

Man's development of language has been one of his greatest achievements. At first he used oral speech; but when recorded speech was invented he was able to overcome many limitations of time and space. The use of books afforded means of self-instruction for all persons who would learn the forms of written language.

Although book methods have serious limitations, they have played a significant part in the development of the human race.

Thoughts and things constitute the instruments of all mental development. At first object materials forced themselves on man's attention and thus became the basis of thought processes. It was necessary to deal directly with nature in order to survive. With the development of language, or thought symbols, natural objects were to some extent dismissed in favor of the use of words. This finally led to a type of education called scholasticism. But it was soon discovered that mortal beings could not live apart from the world about them; and so mind again turned to the contemplation of natural objects. This has brought object materials into the study of many relationships. The walls of the school have been extended to include all nature. Laboratories, life conditions, and project procedures are now used along with verbal methods in the formal instruction of children.

Early methods of instruction were developed in accordance with individual needs; but with the increased demand for popular education and the limited facilities for teaching, there was a change from individual to mass instruction. In consequence of the large elimination of pupils under mass instruction, in consequence of the development of genetic psychology resulting in a better understanding of individual differences, and in consequence of an insistent demand for ridding the child of restrictions that hamper self-activity, the schools are changing more and more from mass instruction to individual instruction. The new procedure is usually spoken of as supervised study or directed study.

Directed study places more responsibility upon the learner. Instead of being an autocrat, the teacher becomes a stimulator, a helper, or a guide. This plan of instruction has brought about a new arrangement of materials. It has also resulted in giving the individual pupils more liberty in learning. Old methods of teaching have not been discarded, but they have been revised and are now applied in accordance with new conceptions of instruction.

In this new procedure many difficult problems have arisen. Suitable materials in different fields of knowledge must be selected and organized, better technique for rendering assistance to pupils must be devised, and teachers will need a more thorough training in the fundamentals of teaching before directed study can be used with a maximum degree of effectiveness. However, the trend in favor of directed study is strong, and substantial progress has already been made in its use.

EXERCISES

1. Make lists of ten problems each in any two fields of subject materials, such as the sciences, the languages, or the social studies.

2. Develop a general principle, using the steps in induction; then apply to some single case the principle developed, using the steps in deduction.

3. From different books on principles of teaching make a list of different types of teaching and compare the types selected with the procedures discussed in the foregoing chapter.

4. Compare the relative values of oral instruction and written or book instruction.

5. Give illustrations of the uses of textbooks as tools; as guides; as sources of knowledge; as means of interpreting truth; as incentives (see Hall-Quest, *The Textbook*, pp. 122–241).

6. Compare the relative values of demonstration by the teacher and experimentation by the pupil.

7. Explain what is meant by the statement "Methods should be adapted to materials and to the advancement of pupils."

8. Suggest projects that may be used in teaching arithmetic, composition, health, history, drawing, and cooking.

9. Enumerate difficulties that may arise in connection with the use of directed study in teaching.

10. Make a list of changes in methods that have resulted from recent discoveries in the field of psychology.

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CHAPTER V

TEACHERS FOR THE MIDDLE GRADES

I. THE PRESENT SUPPLY OF TEACHERS

Reorganization and the supply of teachers. The last decade of the nineteenth century was a period of great awakening in American education. The Committee of Ten and the Committee of Fifteen made their reports. The former proposed a reorganization of materials in secondary education; the latter dealt with the program of studies in the elementary schools. The Committee on College Entrance Requirements made its report in 1899. These committees discussed materials, methods, programs of study, and problems dealing with the articulation of the different segments of the school system. The colleges undertook to outline certain subject materials for the high schools, and the high schools asked that certain high-school subjects be pushed down into the elementary schools. If the proposals were to be accepted it was evident that the teaching corps would be greatly affected.

A new psychology and the supply of teachers. Between 1890 and 1900, while proposals for the reorganization of courses of study and school units were under consideration, the effects of a new psychology upon materials and methods began to appear. The National Herbart Society was organized by De Garmo, the McMurrys, and others for the purpose of furthering the idea of basing procedure in teaching upon the psychology of learning. The works of William James and John Dewey began to influence method, and in 1898 Dr. Nicholas

Murray Butler called for a new base line for determining the divisions of the school system. This he proposed to locate in the nature and needs of the child. So far the changes suggested had dealt largely with the assignment of the school materials to the different segments of the school system; now, if the nature and interests of the child were to play a part, it would be necessary for teachers to use methods based upon psychology.

New materials and the supply of teachers. Along with the movement looking to the rearrangement of old materials, there came a large addition of new subject matter which called for new procedures of instruction. The existing high-school teachers were trained in foreign languages and mathematics, but they were in no wise prepared to teach the physical or social sciences, the manual arts, modern commercial forms, or the elements of the fine arts. Not only were the teachers in the elementary schools poorly trained, but the materials used were archaic. With the addition of new materials came the demand for a larger supply of better-trained teachers.

Training of teachers for the high schools. Since the colleges were interested in the product of the high schools, they had much to do with the selection of high-school materials and methods. This control was brought about through the evaluating and accrediting of work done in high-school classes, or through high-school teachers who were encouraged to imitate the methods of college instructors.

With the development of departments, schools, or colleges of education, procedures in high-school teaching have been greatly improved; but until recently colleges and universities have given little or no attention to the training of teachers for the middle grades.

Training of teachers for the primary grades. Concurrently with the development of provisions for the preparation of high-school teachers by colleges and universities, normal schools were improving facilities for the training of teachers for the elementary schools. At first, courses taken by the prospective elementary teachers dealt almost exclusively with subject matter. Later, methods were considered along with matter. This brought about a greater efficiency in teaching procedure. But the materials and methods developed applied more especially to the kindergarten and primary grades, and little attempt was made to prepare teachers for the middle grades.

Demand for restaffing the middle grades. While the higher institutions were working with high-school teachers, and the normal schools were concentrating on the primary grades, the preparation of teachers for the middle grades was largely neglected. Because of this absence of any direct interest in the middle grades on the part of the teacher-training institutions, three very unfortunate conditions came to exist. In the first place, the middle grades became the dumping ground for dead subject materials; in the second place, neither the methods of the primary grades nor the college methods used in the high schools were suited to the needs of middle-grade pupils; in the third place, teachers without training or ambition often drifted into the middle grades. Because of these conditions, brought to public attention by an awakened appreciation of the importance of the period of child life immediately preceding or during early adolescence, an insistent demand has arisen for the restaffing of the middle grades with teachers trained specifically for this division of the school system.

II. THE TEACHER'S PERSONALITY

Physical endowment. Good physical endowment is an asset in every field of human activity. More recently this principle has been accepted in the selection of teachers. Although the application of the principle is still in its infancy, the demand for the physical examination of teachers is increasing. In former times the selection of teachers was too often an award of charity in which poverty, decrepitude, or physical deformities were considered in favor of the applicant. But times are changing: today good eyes, good ears, good lungs, good vocal organs, a body free from contaminating diseases, and a face without repulsive deformities and capable of at least an occasional smile are coming to be considered as minimum requirements for admission to the teaching profession. Pupils in the middle grades are especially susceptible to the influences of teachers possessing good physique. In at least one instance the principal of a junior high school proved to be correct when he observed that a certain student-teacher would have no trouble with discipline, since she had an attractive face.

Mental ability. Good mental endowment in the teacher is the most fundamental factor in all teaching. It is the only recompense for physical shortcomings, it furnishes the basis for both teaching and governing skill, and it is the most potent factor in the entire domain of personality.

The recognition of vast individual differences in mental capacities has become one of the most powerful influences in the determination of modern methods and materials. All grades of intellect from imbecility to genius may be encountered among pupils in the schoolroom today. That the teacher may be able to cope with all grades of mentality she must at least rank above the grade of mental mediocrity herself.

Mental measurement may soon be enlisted in the selection of teachers in order to eliminate the unfit from the teaching profession. Let us hasten the day when mental requirements for teachers in the primary and middle grades shall be the same as for teachers in the high school. This proposal may be defended on the ground that the needs for recognizing different abilities, for discrimination in applying materials and methods, and for the use of discretion in settling problems of control while the pupil is passing through the breakers of pubic change, call for teachers of good mental ability.

Dynamic traits of personality. One may possess a good body along with good native mental endowment but still be a poor teacher. Many minds may be rewarded with eminent success when applied to the manipulation of material things but reap a harvest of disastrous failure when they undertake to influence the lives of other people. While physique and brain are tools of instruction, success or failure in teaching will be determined by the ways in which these are applied.

Some of the more important traits of personality requisite to a successful teacher are sympathy, insight, adaptability, toleration, fairness, initiative, good judgment, enthusiasm, industry, and instructional skill. A cold-logic machine may exist bereft of one or many of these, but such personality will usually have little influence upon young people.

III. THE TEACHER'S UNDERSTANDING OF THE MIDDLE GRADES

Different types of teachers. Although schools rank among the older institutions of civilization, little attention was given to the study of personnel in the selection of teachers until very recent times. Crabbed old men were placed over young boys, and unsympathetic, quarrelsome women were intrusted with the education of young girls; or, still worse, sometimes men without understanding of childhood were placed over girls, and women ignorant of the impulses of boyhood were assigned to the control of boys.

Not only does lack of understanding subtract from success in teaching, but certain individuals are often naturally better suited to some levels of instruction than to others. This has been recognized recently in the selection of a certain type of person for kindergarten teachers, of another type for high-school instructors, and of still a different type for instructors of college students. The selection of personnel is becoming a problem of such recognized importance that it is receiving marked attention not only in the professional world but in the business world as well.

In common with the movement looking to the selection of suitable teachers for other segments of the school system, the importance of providing proper personnel for the middle grades should not be overlooked; these grades should no longer be manned by "left overs" from other parts of the school system.

Understanding of middle-grade pupils. In former times little was known concerning the physical or mental growth of children. While scientific knowledge bearing upon periods of growth is still limited, enough information has been collected to justify the assertion that significant changes in body and mind take place in children from ten to fifteen years of age. Whereas it was formerly believed that the reasoning powers did not begin to develop until near the close of this period, it is now known that children begin to reason almost from birth. Bonser[1] has shown that children in the middle grades reason with considerable facility.

No mechanic would attempt to take up the mending of machines without making a study of their parts; no stock raiser would succeed in rearing animals without some understanding of their habits; certainly no teacher should attempt to deal with a period in life so significant as that of preadolescence and early adolescence without a clear understanding of its conditions.

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[1] F. G. Bonser, *The Reasoning Ability of Children of the Fourth, Fifth, and Sixth School Grades.*

Understanding of middle-grade materials. One of the principal reasons given for organizing the junior high school was that too much dead subject matter had drifted to the upper grades of the elementary school and the lower grades of the high school. This led to an effort to reorganize materials in the middle grades. This reorganization is of vital concern to the middle-grade teacher; surely no one should undertake teaching in the middle grades who does not have a genuine interest in this important factor of school work. Much work on materials must yet be done; consequently only those should be intrusted to enroll for the service who are competent and willing to carry forward the task already begun.

Understanding of middle-grade methods. Heretofore, books and book methods have prevailed as the principal means of instruction in the schools. Writing, spelling, oral reading, and formal grammar occupied much of the pupil's time. These were all based on book materials. Mathematics was taught by the deductive method, geography was not related to life conditions, and the practical arts and sciences had not reached the lower grades. In all procedures of teaching, if the child could not give the answer, the teacher recited for him.

Today it is proposed to change to a new set of methods. The teacher is to become a stimulator, an adviser, or a guide. A new meaning is to be given to study. As far as possible the pupil is to become his own teacher. Consequently the teacher is called upon to master and apply a new set of methods in keeping with the new materials and new ideals of instruction.

The teacher's preference in work. Just as some teachers derive most pleasure from teaching small children, others from dealing with high-school pupils, and still others from working with advanced students, so should the teacher in the middle grades realize the greatest enjoyment from her own particular field of work.

Under present conditions ambitious, capable teachers are not likely to turn to the middle grades. When promising teachers do begin in the middle grades, they usually move on as soon as possible to the high school, where remuneration is greater or where teaching conditions are more stimulating. This would not be the case if the teaching conditions were improved and salaries were made equal to those provided for high-school teachers. This assertion is made upon the authority of middle-grade teachers who are enjoying the recognition accorded teachers in the high schools.

Those who work with middle-grade pupils find them not only fascinating but inspiring. Certainly no more valuable service can be rendered than that bestowed upon young people in the plastic period of prepubescence and early adolescence. The enthusiasm of teachers for pupils in the middle grades was well expressed by a vice principal in general charge of the boys in one of the oldest and best-organized intermediate schools on the Pacific coast. When asked what she did with the bad boys, she replied, "We have none." The possible exaggeration in ascribing faultless characters to the one thousand boys under her supervision will be partly or perhaps wholly excused by those who have enjoyed the thrill that comes from the willing response of boys and girls just approaching early adolescence or in its midst, when they are understood and properly treated.

IV. THE TEACHER'S PREPARATION

Academic training. The minimum academic and professional training required for a teacher in the middle grades should ultimately cover at least a four-year course in a teacher-training institution. The writer is well aware that some time will be required before this standard can be fully applied. The important consideration is that we shall make progress toward it. This may be done by requiring teachers in service to take up study courses, by selecting for new positions those who have either completed the standard courses or are well on the way, and by giving such professional and financial recognition to middle-grade teachers as will attract candidates of standard ability and training.

The right selection of a teacher-training institution is the first problem that should confront the prospective candidate for a teaching position in the middle grades. If he selects an academic institution, rigid requirements for a degree may prohibit the election of courses best suited to his needs; indeed, suitable courses may not be offered by the institution. As a result of one or both of these conditions the student may be trained away from his future life work. If he selects a teachers' college, he may be allowed to substitute too many professional courses for basic academic courses. A sacrifice of sound scholarship in training will result in limitation of success in practical life.

It is a regrettable fact that academic institutions have yielded too slowly to the need for the proper training of teachers for the middle grades, and many of the teachers' colleges have not yet developed suitable academic courses for prospective teachers.

While the subjects that the student expects to teach will determine, in part, the academic training that should be secured, there are certain courses that all teachers should study. Nor is it at all times easy to draw a line between academic and professional subjects.

Every teacher should be grounded in the proper use of his own language. Since all teachers will be citizens, they should take basic courses in the social sciences. Courses in psychology should be included in every prospective teacher's curriculum.

Enough biology should be taken to insure a clear understanding of the conditions of healthful living. One or more courses in some practical art or arts or in the physical sciences should be taken not only for the purpose of securing valuable information, but also for the purpose of learning how to manipulate laboratory materials.

It may be said that since every prospective teacher must establish basic relationships with his own body, his own language, other people, the material world, economic life, and æsthetic appreciation, he should study the principles underlying these relationships as a part of his general training.

Professional training. As already stated, it is not easy to draw a line between academic and professional training. Under present conditions professional subjects will most frequently be mingled with academic subjects in the training of all teachers. A few institutions require the strictly professional subjects to be taken in postgraduate courses. While this may be desirable, the present stage of advancement in teacher-training in the United States will not yet compel a general observance of such standards.

The more common of the professional courses now required include reviews, the elaboration and organization of subject matter, general and special methods suited to different materials, courses in applied psychology, tests and measurements, the history and philosophy dealing with different parts of the school system, and, finally, observation and practical experience in teaching under expert supervision.

Although the professional training of teachers for the lower grades has been carried on to some extent by the normal schools for the greater part of a century, and although preparation of teachers for the upper grades has been fostered by the colleges for a generation, no serious attempt to equip teachers especially for the middle grades was made until a decade ago.

With the introduction of the junior high school came the demand for a better professional training for all teachers of the middle grades. The reasonableness of the demand has been attested by the cordiality of the response, which has led many of the leading teacher-training institutions in the United States to introduce courses dealing specifically with the materials, methods, and control of the middle grades.

V. CHAPTER SUMMARY

In the last decade of the nineteenth century the Committee of Ten, the Committee of Fifteen, and the Committee on College Entrance Requirements made significant reports bearing upon the reorganization of methods and materials in the elementary and secondary schools. It was clear that the reorganizations suggested would call for readjustments in the teaching corps.

While the reports of the committees just mentioned dealt chiefly with the reorganization of materials and school units, certain writers were formulating a new psychology which called for a revision of methods to comply with the nature and interests of learners.

Along with reorganization of school units, the changes in programs of study, and the new psychology, came a large expansion in subject materials. The existing teachers, although prepared in the traditional subjects, were not able to handle the physical or social sciences, the manual arts, simple commercial forms, or the elements of the fine arts.

Since the colleges were interested in the product of the high schools, they attempted to improve high-school teaching through evaluating and accrediting of high-school work or through the training of high-school teachers in collegiate departments of education. At the same time the normal schools took up a more serious training of teachers for the elementary schools. Since no teacher-training institutions were directly interested in the middle grades, dead materials, routine methods, and unambitious teachers drifted to the middle part of the school system. This condition finally became one of the important factors that led to the introduction of the junior high school.

In restaffing the middle grades a more critical analysis of teacher personality is now demanded. Good mental and physical endowment is required, along with such dynamic traits as sympathy, insight, adaptability, toleration, fairness, initiative, good judgment, enthusiasm, industry, and instructional skill.

In addition to other qualifications, the teacher in the middle grades should have a dominant interest in this particular part of the school system. He should have a commanding knowledge of preadolescent and early adolescent pupils, of materials suited to the varying needs of different groups, as well as insight into the best procedures for handling growing minds and living materials.

The minimum academic and professional training necessary for a teacher in the middle grades should cover a period of at least four years of study in an efficient teacher-training institution. The requirement of a year of postgraduate work is the standard proposed by some writers.

The selection of a teacher-training institution is a serious problem. Academic institutions tend to resist the inclusion of professional courses, and teachers' colleges may neglect basic academic courses for professional materials. However, conditions for training teachers in both types of institutions are improving rapidly.

Since all teachers should establish relationships with their own bodies, their own language, their fellow beings, the material world, economic life, and æsthetic forms, basic courses in these several fields should be included in the prospective teacher's curriculum.

Professional training should include phases of applied psychology, general and special procedures in teaching, reviews and elaboration of subject materials, standards for scientific measurements, principles of organization and control, the history and philosophy of middle-grade education, along with observation and practical work under expert supervision.

EXERCISES

1. Make a list of reasons that might be advanced in support of a single-salary scale for teachers of all grades in the public schools.

2. Construct a score card for the selection of teachers for the middle grades.

3. From the catalogues of the teacher-training institutions in your own state make a list of the courses offered that are especially suited to the training of middle-grade teachers.

4. Select three books, three educational journals, and three magazines that would be of special service to teachers of boys and girls from nine to fifteen years of age.

5. Make two lists of fifteen books each, one for boys and one for girls, that you would recommend to pupils twelve years old.

6. Outline the personality, training, and previous experience that you would require of the principal of a junior high school.

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Points out the need for the training of teachers for the newly organized intermediate, or junior-high, schools; suggests the phases of training needed; and claims that the normal schools should do the work.

STAYER, S. B. "The Status of Teachers in Junior High Schools," *School Review* (May, 1921), Vol. XXIX, pp. 379–387.

Gives the sex, experience, training, and salaries of junior-high-school teachers in ninety-nine cities distributed over thirty-six different states.

PART II. MATERIALS AND METHODS APPLIED

CHAPTER VI

MATERIALS AND METHODS IN HEALTH EDUCATION

I. CHANGES IN MATERIALS AND METHODS

Early physical education in the home. So far the schools have assumed three different attitudes toward physical education. At first the entire responsibility for the bodies of children was placed upon the home. Beginning with the fourth quarter of the last century certain theoretical instruction on anatomy, physiology, and hygiene was undertaken in the schools. More recently the schools have not only undertaken to give health instruction, but they also propose to assist in its practical application.

When health education and physical development were left to the home, some children received attention, but many received none. In some homes commendable effort was made to join practice with theory. The selection of food, hygienic habits of living, medical service, and proper exercise received the attention of some parents, but such precautions were not common. Indeed, in many homes, little study was made of bodily needs, and medical service was never enlisted except in cases of severe illness or serious accident. This is not strange, indeed, when it is recalled that until comparatively recent times sickness was regarded as the infliction of an evil spirit, that old women often performed imperative surgical operations or administered herbs for different maladies, that preparation for the practice of medicine was secured through a short course taken under some practicing physician, and that the books on physiology and hygiene were few and unreliable.

Early physical instruction in the schools. As was the case with other sciences, the subject matter of anatomy, physiology, and hygiene at first was poorly adapted to the practical needs of daily life. A textbook[1] published in 1870 contains the following statement in the preface:

> My former work was published in 1849, and thoroughly revised in 1852. Several hundred thousand copies of the revised edition have been published in seven different languages, by the missionaries and teachers in Asia and Europe.

The table of contents of the 1870 edition of this book contains the following topics: anatomy, histology, chemistry, physiology, and hygiene of the bones. The muscles, the digestive organs, the circulatory, respiratory, and vocal organs, the nervous system, and the special senses are treated in the same technical order shown above for the study of the bones. After each division of the body (for example, the bones or the muscles) a comparison is made with the corresponding structures of the lower animals.

It may be argued that this book was intended for use by adults only. Such was not the case, for as late as 1885 it was offered for use in the "common schools." According to the title it was intended for "families" as well as for "colleges and academies."

One of the earliest textbooks proposing to teach the laws of health in the schools was Steele's *Human Physiology*.[2] An attempt is made in this book to treat in a condensed form the structure, function, and care of the parts of the body. Some attention is given to diseases and abnormal conditions of the different organs, but the brevity of the treatment leaves little more than an enumeration of bodily defects and physical weaknesses. In view of a future development it may be noted that this book treated alcohol and tobacco in four short paragraphs.

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[1] Calvin Cutter, M. D., *New Analytic Anatomy, Physiology and Hygiene, Human and Comparative, for Colleges, Academies, and Families, with Questions.* J. B. Lippincott Company.

[2] J. Dorman Steele, Ph. D., *Fourteen Weeks in Human Physiology.* A. S. Barnes and Company, 1872.

Influence of the "temperance movement" on the teaching of physiology and hygiene. The greatest single influence, perhaps, leading to the teaching of physiology and hygiene in the schools came through the activities of the National Woman's Christian Temperance Union. Between 1880 and 1890 this organization caused laws to be enacted in many states providing for the teaching of "hygiene and temperance" to all pupils.

For almost twenty years, or from 1880 until about 1900, the different series of textbooks on physiology and hygiene printed within their covers the indorsement of the officials of the National Woman's Christian Temperance Union. Showing the trend in subject matter for that period, the following quotation taken from the preface of one book[1] is presented as typical:

> This work has been designed for use in Intermediate and Grammar Schools for the purpose of teaching the rudiments of physiology and hygiene.
>
> The effects of alcohol and narcotics have been most carefully considered, and the facts presented in this connection are in accordance with the latest scientific conclusions. The requirements of all state laws relating to the teaching of these subjects have been fully met. One fourth of the entire book has been devoted to the consideration of alcohol and narcotics.

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[1] *Lessons in Physiology and Hygiene.* Maynard, Merrill and Company, 1895.

Broader conception of hygiene since 1900. With the opening of the present century textbooks on physiology and hygiene began to reflect a more practical type of subject materials. This may be shown by an examination of the table of contents of one of the books of that period, which contains the following topics:[1] our food, our drink, temperance, the skin and the kidneys, the bones, the muscles, the blood and its circulation, breathing and the lungs, the nerves and the brain, the eyes and their care, the hygiene of the ear, the teeth and their care, disease germs, some diseases of modern life, physical exercises, first aid to the injured, and public sanitation.

In addition to the introduction of more practical subject matter, new proposals were made in the forms of presentation. In 1906 Dr. Luther Halsey Gulick planned a series of hygiene readers.[2] These books contain stories intended to teach lessons of personal and community hygiene by clothing them with concrete conditions in life. Among others the following topics are used: "Breathing and Pure Air," "A Little Lesson about Little Things — Microbes," "The Way to treat the Finger Nails," "How to carry the Injured," "Accidents from Heat and Cold," "Rivers, Drinking Water, and Sewage," "Danger from the School Desk," "Effects of Drugs," and so on. Other good examples of health readers are the ones by O'Shea and Kellogg[3] and the series by Cuzzort and Trask.[4]

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[1] William O. Krohn, M.D., Ph.D., *Graded Lessons in Physiology and Hygiene.* D. Appleton and Company, 1908.

[2] The Gulick Hygiene Series: Book I, *Good Health*; Book II, *Emergencies*; Book III, *Town and City*; Book IV, *The Body at Work*; Book V, *Control of Body and Mind.* Copyright, 1906, 1908, 1909, by Ginn and Company.

[3] Health Series of Physiology and Hygiene: *Health Habits*; *Health and Cleanliness*; *The Body in Health*; *Making the Most of Life.* By M. V. O'Shea and J. H. Kellogg. The Macmillan Company, 1915.

[4] Cuzzort-Trask Health Series: *Health Lessons*; *Primer of Personal Hygiene*; *Health and Health Practices*; *Essentials of Physiology, Hygiene and Sanitation.* By Belva Cuzzort, A.M., and John W. Trask, M.D. D. C. Heath & Co., 1923.

The World War and health education. For the first time in its history the American nation was aroused to a deep appreciation of the need for health instruction for all classes of people by the disclosure of the physical inefficiency of those who were called to the colors in the World War. The splendid effort made to provide wholesome food, proper exercise, and favorable living conditions for the soldiers had a salutary influence on the people at home. The demand for conservation of food called attention to food values. Bulletins prepared by the government were distributed to the homes and the schools. The following quotation is taken from the preface of one publication:[1]

> The National Education Association, at its annual meeting, July, 1918, adopted a resolution calling upon the United States Food Administration to "prepare in a form suitable for use in public schools, and particularly in the upper grades, lessons and materials supplementary to existing courses, which will promote the program of food conservation."

Some of the topics treated are "Food Saving and Sharing," "Food in General," "About Fruit and Vegetables," "Foods that Help build the Body," "Cereals," "Foods Rich in Starch," "Sugar and Sweets," "Fats and Fatty Foods," etc.

Another booklet treating of the same type of topics was prepared by Farmer and Huntington[2] for use in the schools. These are mentioned as illustrations of materials relating to food. On the side of exercise the war yielded some excellent material for the schools. The introduction of one of the typical publications[3] contains the following paragraph:

> One of the results of the Great War has been a sharp criticism of the public schools of the United States. In the early days of the

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[1] *Food Saving and Food Sharing.* Doubleday, Page & Company, 1918.

[2] A. N. Farmer and Janet Rankin Huntington, *Food Problems.* Ginn and Company, 1918.

[3] Captain N. H. Pearl and Captain H. E. Brown, *Health by Stunts.* 1919. Reprinted by permission of the Macmillan Company, Publishers.

selective draft, it was found that many young men were rejected for physical disabilities and deficiencies, many of which were unnecessary and could easily have been overcome or would never have been developed if a more intelligent system of physical education had been in general use in the schools. These criticisms were so sharp that already a marked effect on public school practice is being noticed. These modifications are in the direction of more liberal time allotments for physical education work and a recognition of the value of many forms of physical exercises at one time common in the life of the boy, but of late years, particularly in our more congested centers of population, neglected and to a large extent lost.

Among others the following topics are presented in *Health by Stunts*: "The Great War as an Impetus," "Existing Physical Conditions," "Organizations," "Athletic Events that can be Timed or Measured," "Stunts, Individual and Combination," "The Major Sports of the Elementary School," and so on.

Agencies contributing health materials. Theory in health education without application is of little value. For many years the physiology and hygiene taught in the schools produced little change in life conditions. Two reasons may be given for the poor results obtained: the theory offered was not sufficiently related to immediate needs, and no motivating forces were provided for leading children to apply to the actual improvement of their own bodies the lessons learned from books.

Much has been added to the theory of physiology and hygiene within the last few years, but more has been done in the way of practical application. We need not look to books alone for recent improvement in health education, but should give much credit to different organizations that have led children to participate in healthful activities. The scout movement, the camp-fire organizations, various forms of athletics, different garden or field clubs, prevocational courses in schools (including various forms of industrial activities), the introduction of cafeterias or lunch counters into the schools, and better provisions for sanitation have all contributed excellent health materials.

Résumé of earlier methods. Earlier methods for teaching anatomy, physiology, and hygiene may be ascertained from early textbooks. The general procedure found in these books included recitation, questions and answers, and drill or review. Anatomical figures and so-called "practical questions" contributed somewhat to an understanding of the text.

The types of teaching just mentioned, modified somewhat by the story form of subject matter with set questions, continued to prevail for many years; but in 1893 Blaisdell [1] wrote in the preface of one of his books:

> It is now generally admitted that actual observation and actual experiments are as necessary in the study of elementary physiology as in any other branch of science. We must handle the skeleton itself if we wish to get a fair idea of its bones. We must examine a drop of blood under the microscope if we would know how blood looks. Hence, as supplementary to the text itself, we have added a series of practical experiments. Most of them are simple, and require only a little painstaking and inexpensive apparatus to do successfully. These experiments should be actually performed, and not merely read as a part of the text.

Some forty-eight pages in the latter part of the book are given to the so-called "practical experiments," but judging from the nature of these experiments it is safe to say (since the book was prepared for the upper grades in the elementary schools) that few of them were performed by the pupils. Twenty-three pages of "Test Questions for Review" are grouped, according to chapters, near the end of the book.

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[1] Albert F. Blaisdell, *Our Bodies and How we Live.* Ginn and Company, Publishers, 1896.

With the beginning of the present century, along with great improvements in the subject materials in physiology and hygiene, more effective methods of teaching began to appear. Not only is the reading matter presented in a more pleasing style, but the books contain numerous drawings, figures, and photographs. One author boasts that his book includes "one hundred and ninety-eight figures, sixteen of which are colored." "Important points," "summaries," "questions for discussion," "health problems," "exercises," and "experiments" are some of the terms that indicate extensions in procedures of teaching. Laboratory work for pupils of high-school grade came to be outlined in separate manuals.[1]

It may thus be seen that the early types of teaching physiology and hygiene included the didactic or telling method, the analytic or discussion method, the synthetic or question-and-answer method, the descriptive or story method, the picture or graphic method, and the experimental or laboratory method. Various modifications and combinations of these were sometimes used. With the improvements in both materials and procedures, instruction in health education has made considerable progress within the last decade.

II. THE BASIS FOR WORK TO BE DONE ASSUMED

Knowledge and habits assumed. It is not to be expected that the first nine or ten years of the child's life will be spent without learning something of the care and welfare of the body.

For the first six or seven years the parents are in complete control. Such attention will be given to the bodies of children during this period as the means, time, and interests of the parents may dictate. The absence of any one of these factors, however, may mean stunted or deformed growth, perverted habits in the use of food, or complete disregard of the simplest laws of personal hygiene. The child may be said to be still in the animal stage when he enters school. Much that he has learned in the way of bodily habits has been forced upon him. He should come to school, however, with some disposition toward cleanliness, self-control in eating, and care for the simple laws of bodily hygiene.

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[1] Walter Hollis Eddy, A. M., Ph. D., *Experimental Physiology and Anatomy.* American Book Company, 1906. See also Carl Hartman, *Laboratory Manual for Human Physiology.* World Book Company, 1914.

For the first two or three years in school the child will be gaining rapidly in height and weight, the brain will approach its ultimate size, and the vital capacity will increase much faster during the years from six to nine than from nine to twelve. Serious attention should be given to children's physical development in the first years of school life, but certain limitations are placed on rapid habit formation because of the undeveloped state of the brain.

What, then, should the normal child of nine or ten years of age know about his body, and what health habits should he possess? In general, he should know that his body is growing rapidly; that proper food, clothing, and shelter will make him strong and healthy; that poor food, improper clothing, and exposure will stunt the growth, weaken the organs, and cause disease and suffering. He should know that pure air and exercise are essential to healthy growth; that the body demands different kinds of food just as different kinds of materials are required for the construction of a building. He should know that pure water and milk are more valuable to the body than coffee or tea. He should understand that clothing is intended to protect different parts of the body from exposure and from changes in temperature and moisture; that failure to wear proper clothing will lead to sickness or, perhaps, to deformities. A child of nine should know that sleeping in a closed room, reading by a poor light, playing in filth, eating at irregular hours, or staying up late at night endangers the growth and health of his body. He should know that flies, mosquitoes, and vermin of all kinds are dangerous to health; that diseases lurk in unsanitary toilets, outbuildings, and filthy places. He should know that it is dangerous to wear the clothing of other people, to drink from a common cup, or to place in the mouth articles not properly prepared for food. The theoretical knowledge outlined, however, would be of little value unless joined with proper attitudes and habits.

The child of nine or ten years should have developed certain very definite attitudes and practices relating to health habits. He should be willing to heed the advice of parents or teachers concerning food, clothing, and shelter, even when it conflicts with his own desires. This means that he should possess the habit of eating things that may not at first be pleasing to the taste, of denying himself food and drink that are known to be injurious, and of observing regular meal hours. It means that he should have developed the habit of exchanging the clothing used during the day for proper night clothing, of sleeping with open windows, and of giving proper attention to the body after getting up in the morning. The health habits of a child entering the fourth grade should include a willingness to wear proper clothing to school or elsewhere at the expense of his own convenience.

In addition to the possession and application of certain elementary knowledge related to food, clothing, shelter, and immediate surroundings, children in the first three grades should be accustomed to certain daily exercises. Aside from the activities involved in home duties, an organized system of plays and games should be learned and used by all pupils. Children are born with an impulse to bodily movement. In young children this impulse is best expressed in bending about, swinging the arms and legs, running and jumping, or marching, all of which lend themselves to rhythmic songs, dramatic actions, gymnastics, plays, and games. To summarize, children on reaching the fourth grade should be able to perform and enjoy a considerable number of both formal and informal physical activities.

III. DIAGNOSIS AND REMEDIAL TREATMENT

Four phases of health education. Since the middle grades, because of compulsory-attendance laws, handle from 85 per cent to 90 per cent of all children from nine to fifteen years of age, the schools should play an important part in laying the foundation for efficient health education. This may be best accomplished by means of four different lines of operation. The lines proposed are (1) medical examination, followed by minor remedial measures in the school and major processes in the home (or both in the home if parents can and will provide proper medical attention); (2) provision of favorable living conditions with special reference to food, clothing, and shelter; (3) such theoretical instruction pertaining to the structure, functions, and care of the body as may be directly applied in daily life; (4) adequate provision for a comprehensive system of physical exercises to be graded and directed by trained health supervisors in the schools.

Physical diagnosis. It is not expected that medical examination of children will begin with the middle grades. In some cases family physicians have repeatedly performed that service in the home. Whether or not children have received proper medical attention in the home, the school should make an inventory of every child's physical and mental status on receiving him into the school. He should also be reëxamined from year to year while he is passing through the school.

While the growth during the first three years in the middle grades, or in the child of normal advancement from nine to twelve years of age, is not so great as for the three preceding years or the three succeeding years, nevertheless important adjustments are taking place. The appetite is keen, the child leads an active life, and very important habits are to be either accentuated or inaugurated.

A complete physical chart of every child should be made, and he should be encouraged to study and use this chart in the improvement of the different parts of his body. A thorough examination will not only disclose weaknesses in need of remedial treatment but will also relieve parents and children of fears concerning such parts of the body as are strong.

The individual charts should show the age, height, weight, lung capacity, blood pressure, and conditions of the digestive tract, the nervous system, and the special senses. Deformities, enlarged organs, or abnormal growths should be charted. Previous operations or cases of illness should be recorded so that those charged with the care of the child's health may be on the alert for any recurrence of previous maladies. Satisfactory vaccination scars and the presence of diseases or the disposition to special disorders should be noted.

The school clinic. The school has already taken steps to rid itself of pupils afflicted with dangerous diseases. In many places clinics have been set up for the purpose of administering remedies in minor cases. Vaccination, care for accidents about the school premises, removal or mending of teeth, small surgical operations, as well as the administration of medicines in case of sudden or temporary illness, have been provided for in many school systems. Doctors, dentists, and nurses are coming to be looked upon as essential members of a modern school organization.

It is not proposed to take from parents the right to have children treated by their own family physicians. Furthermore, it is not expected that school physicians will undertake to treat all cases submitted by willing parents. It is proposed, however, that every child in need of treatment shall be cared for in some manner. The school physician may administer temporary treatment before turning the case over to the family physician.

Health equipment. While the school should conduct the clinic as a means of correction, it should also provide necessary constructive forms of health equipment. Sanitary drinking fountains; lavatories; efficient apparatus for heating, lighting, ventilating, and cleaning buildings; suitable seating, library, laboratory, and blackboard facilities; provisions for gymnasium and playground equipment, swimming pools, playing fields, lunch counters and cafeterias, — these are some of the more important forms of health equipment required. As evidence of the approval and coöperation of parents in efforts to develop the bodies of children by these means, the splendid service of mothers' clubs and parent-teacher associations in making provisions for different forms of material equipment may be cited.

IV. FOOD, CLOTHING, AND SHELTER

Physical changes and food supply. It is an axiomatic fact that brick cannot be made without clay nor can buildings be constructed without materials. No more can the human body grow without a proper food supply. That the basic organs of the body increase considerably in size and tend to take permanent form in children from nine to fifteen years of age is well established. The fact that children in this period eat voraciously might be expected. That tastes change, that new dishes are added to the menu, that children delight in articles of food which furnish strong stimulation to the taste organs, may be explained by the increasing demand for food at this particular time of life.

It should be noted, further, that along with the growth of bones, muscles, and nerves, mental attitudes and habits relating to food are being formed. At this time variety may replace monotonous uniformity of diet, foods of more value may be substituted for those of less value, temperance in eating may supplant gluttony, and good manners in eating and drinking may be cultivated.

Food selection. Under rural conditions food selection is more or less controlled by immediate environment. Fruits, vegetables, chickens and eggs, milk, different birds and animals, provide the food elements required. City or village life, which now includes more than half the people of the United States, greatly complicates the problem of food supply. In the absence of gardens, orchards, or domestic animals the housewife must turn to markets. Here she is limited in three ways: she may be ignorant of the body's needs, the supply may be deficient, or the price may be beyond her means.

Again, in this day of cafeterias, lunch counters, hotel menus, and club dining halls the problem of food selection has been shifted from the housewife to individuals, children as well as adults. Children coming into the fourth grade should know that the body requires different kinds of food, such as fruits and vegetables, meat, milk, eggs, cereals, sugar, and fats. They should also be accustomed to the use of some forms of these each day.

In the fourth, fifth, and sixth grades they should learn the simple classification of foods and become familiar with several representatives of each class. They should learn the sources of many articles of food and be able to recognize different varieties in the markets. The parts of a beef, different kinds of fish, flesh, or fowl, the principal vegetables and fruits, and the leading types of some of them, should be readily recognized. The processes of preparation of canned and uncanned foodstuffs, the dangers of decay, and symptoms of spoiled goods should be studied.

The prices of various forms of foods should receive attention. The relative merits of shipped and home-grown products, of fresh and refrigerated stocks, the causes of seasonal changes in prices, the proper or improper use of common preservatives, the dangers arising from lack of protection and the use of improper containers, all of which play an important part in the selection of food, should be taught to children from nine to fifteen years of age.

Not only should children in the fourth, fifth, and sixth grades be taught to select raw food materials, but they also should learn how to select proper menus for the different meals of the day. This may be done through theoretical instruction in the classroom with practical application in the cafeteria or at home. By way of material for the study of food selection pupils may be requested to report the articles of food actually used at home or at school.

Food preparation. While the study of food selection should be carried forward into the seventh, eighth, and ninth grades, food preparation should now receive special attention. Since 93 per cent of all girls marry and become actual or potential homemakers, since 80 per cent of these will never go beyond the ninth grade, and since they will probably come to deal with foodstuffs and the rearing of children, it seems fair to expect that the actual preparation of foods should be made a significant part of their formal education.

It is not proposed, however, to limit the selection and preparation of simple foods to girls alone. In this day when the preparation, transportation, and distribution of food are dealt with more and more by men, when cafeterias or other eating places are conducted by men, when the food in camp life (whether for laborers or for pleasure seekers) is prepared largely by men, when the activities of Boy Scouts and young men's student and social clubs add zest to an understanding of food preparation, why should not boys in the early teens gain some practical knowledge of food preparation?

The different phases of food preparation to be studied in the upper middle grades should include a more detailed analysis of food values, a further classification of foods, some understanding of the use of substitutes, a study of countries and localities producing different foods, and something of the qualities produced.

The work should also include the listing of organizations engaged in producing raw food materials, with some study of the processes used in the manufacture or preparation of common food products. Warehousing, transportation, the commercial control of foodstuffs, and the conduct of local markets should be included as allied problems of food preparation.

Knowledge of food production should not be substituted for the actual preparation of simple meals. First, the principal cooked and uncooked foods of the local community should be listed, some comparisons of the relative values of these two classes should be made, and reasons for cooking should be explained.

The common utensils used in cooking should be secured and their uses illustrated. Different types of heating apparatus should be examined. Methods for cooking such things as meats, breads, and vegetables should be demonstrated. Finally, children should be required to participate in the actual preparation of common foods, both at school and at home. In short, neither girls nor boys should be permitted to complete the junior high school without some practical knowledge of the preparation of simple food materials.

Food consumption and health education. While the selection and preparation of food are the first steps in providing a healthful diet, its proper use is also a vital consideration. Good table manners should not be peculiar to any social class or period in life, but should be taught and practiced at all meals.

With the marked increase in growth of children in the middle grades, accompanied by changes in appetite, many dangers may arise. The candy man and the chili and tamale vender will, if not prevented, do a thriving business in the vicinity of the school. Every interested parent knows the disposition of children to select what is often denominated "trash" in preference to more nourishing foods. By means of lunch counters properly stocked the schools may do much toward establishing the use of proper foods both at school and at home. By the time a child has reached the age of fifteen, proper eating habits should be firmly established, as regards not only the time of eating but also the kinds and quantity of food consumed.

Clothing and health education. The selection and use of clothing, along with food supply, are matters of daily interest to all civilized people. So far the matter of children's clothing has been left largely to the home. Fashions and manufacturers largely determine what people wear. These influences are not primarily concerned with health education. If hygienic interests are to be served, suitable garments to be provided, or appropriate clothing to be worn, coming generations must be educated to demand a better supply, to make a more careful selection, and to observe a more suitable use of all kinds of wearing apparel. Since the middle grades will prepare more than three fourths of the population for future life, so far as formal schooling is concerned, a matter of such great importance as clothing should receive the most serious attention.

Selection of clothing. Important factors bearing upon the selection of clothing are seasons of the year, conditions of the weather, day and night, occupations, social functions, and economic status. These factors call for changes in garments, their number, qualities, weights, forms, and styles. Changes or lack of changes are liable to endanger health.

Why do parents seldom leave the purchase of garments to young people? Why do they find it necessary to select day by day the garments to be worn by each child? The reply may be made that children are not competent to select their clothing. The same statement may be applied to many adults. If so, what is the remedy? Clearly, more attention to the selection of clothing while young people are susceptible to training would assist in mending the difficulty.

In the period embracing the pubic change, clothing becomes a matter of great concern to both boys and girls. This is an excellent time to give instruction and practice in the selection of clothing. Changes in sizes of garments owing to growth, marked developments in social interests, or a desire to dress like companions furnish a basis for motivating selection of dress.

The schools have an opportunity to influence the dress of all classes of children. This may be done to some extent through discussion of fashions, the purposes of dress, and the selection of clothing. Styles, materials, preparation of garments, qualities, costs, and suitability for different purposes will furnish themes for profitable instruction. The real garments themselves should be examined. In addition to the instruction in schools, parents should be encouraged to place more and more responsibility upon children in the selection of their own apparel.

Hygiene and use of clothing. The two uses of clothing are protection and adornment. The latter is often accentuated to the detriment of the former. Fashion has sometimes led to the wearing of furs in summer but not in winter. Head-coverings and footwear too often follow the rules of fashion rather than the laws of health. Exposure of the unprotected body to sudden changes in temperature or moisture often leads to lowered vitality, and this paves the way for diseases lurking about ready to pounce upon weakened or overworked parts of the body.

When suitable clothing has been provided, the next duty is to see that it is kept in hygienic condition. Clothing itself may become a receptacle for the germination or communication of disease. The clothing of children coming from infected homes may distribute disease germs to an entire community. The ventilation of wardrobes, laundering, and, at times, the fumigation of clothing are necessities in all healthful institutions. Lessons on the care of clothing, and the enforced observance of instruction given, will develop cleanliness on the part of pupils, which will ultimately be reflected in better practices in the homes.

Another dominant factor in health preservation is the proper use of the clothing which has been selected and cared for. Going about with insufficient clothing, wearing the same clothing day and night, indoors and outdoors, changing from one weight to another, wearing the clothing of other people, wearing clothing in an unsanitary condition, are some of the dangers connected with dress.

Shelter and health education. Another field of health instruction worthy of consideration — one which involves the school, the home, and public buildings — is that of housing. Although the heating, lighting, and ventilation of school buildings are receiving more attention than formerly, they are still causes of great physical inconvenience and injury. Drafts, cold or overheated rooms, and lack of proper ventilation impair the health and subtract from mental efficiency. The lack of suitable bedrooms or of bathing facilities in the home greatly endangers the health of growing children. Public buildings, including churches, theaters, stores, and professional offices, are often poorly heated, lighted, or ventilated. Improvement in housing conditions in the home may be secured through instruction and the proper observance of living conditions in the schools.

V. FORMS OF HEALTH INSTRUCTION

Informal health instruction. Until children become ten or eleven years of age the instruction concerning food, clothing, exercise, or general school, home, and community hygiene, may be given largely in informal talks. Articles of food, the care of the body, the selection and uses of clothing, the value of sleep, dangerous diseases, and healthful exercise should be discussed with children from day to day. No effort should be spared to insure the application of the principles discussed. Any theory that would permit children to disregard the simple laws of hygiene on the ground that they will learn these later contradicts the laws of habit formation. It should be remembered that habits, either good or bad, are forming all the time.

Formal instruction in anatomy, physiology, and hygiene. By the time the child reaches the pubic change he should have developed a fairly good set of basic health habits. He should now make a more thorough study of the structure and functions of the parts of the body. The dangers of bad environment, the causes and treatment of common diseases, some study of public and private institutions for health improvement, now become proper subjects for investigation. For the first six years the child in the home is able to think of little beyond his own personal need. The first three or four years in school bring him into contact with people in larger numbers. He must then broaden his habits to include the school as well as the home.

VI. HEALTH EXERCISES

Classes of physical exercises. Physical exercises may be divided into three classes according to the type of control involved. These three classes are represented by formal gymnastics, games, and free play. Formal gymnastics consist of certain systems of controlled movements performed for the purpose of strengthening specific parts of the body; games, while conforming to rules requiring definite coördinations of movements, give more freedom to the individual; free play gives to the individual complete control of his own movements. The well-known "setting-up exercises" are illustrations of the first type, football and tennis represent the second, and running, jumping, and swimming are good illustrations of the third. Strength and health of body are important by-products of such activities as housekeeping, camping, school or home gardening, along with certain forms of industrial work now carried on in connection with the school or the home. From the standpoint of bodily development the line between work and play is not easily drawn. If it is true that overwork may break down health, although properly regulated work will build up needed bodily relationships, it is equally true that some types of play may be of little value, although systematic or properly directed play may be made a veritable elixir of life, health, and physical growth.

The program of physical exercises should include all phases of work and play suggested in the preceding paragraph. Gymnastics and rhythmic plays may be given in the classrooms, in the gymnasium, or on the playgrounds. Games for both indoors and playgrounds may be suited to boys and girls. No child should be permitted to leave the middle grades without becoming accustomed to the use of a set of gymnastic exercises, without being able to play indoor and outdoor games, or without developing a genuine interest in some form of manual work.

VII. METHODS IN HEALTH EDUCATION

Types of teaching to be applied. The subject matter of health education lends itself readily to the most natural or approved types of teaching. Natural types of teaching include gesture or dramatization, oral communication, graphic representation, use of objects, solution of problems, and development of projects.

Motivation in health education. Certain natural tendencies in young people furnish the means for leading them to care for the improvement of the bodily organism. These tendencies include curiosity, or a desire to understand things; movement, a disposition common to all animal life; manipulation, or the impulse to handle objects; emulation, or a wish to equal or excel certain standards; and rivalry, or a desire to surpass others. Curiosity may be used in motivating a study of the structure, uses, or movements of parts of the body; movement may be made the basis of all kinds of gymnastic exercises; manipulation lies at the foundation of games of skill and the various activities of industrial life; while emulation and rivalry furnish the motive power for many of the principal physical feats.

In teaching, the fact should be recognized that natural inclinations are not always on the side of health improvement. For illustration, hunger, the first condition of the continuance of life itself, shows little discretion. Inherited tendencies to organic weaknesses, results of disease or lack of proper care, reduce vitality; and low vitality contributes to inactivity on the part of children. The very laws of habit formation tend to militate against improvement; for it is easier to repeat an old act than to learn a new one.

In motivating the various phases of health education, nearness or remoteness of objectives must be kept in mind. Some individuals may be moved to respond to health conditions only by the promise of some immediate reward; others may be willing to deny themselves passing pleasures in order to make the team; still others will forgo the indulgence of appetite, or the temporary enjoyment of dissipation, to train the body for future years in order to satisfy an ambition for a successful life career. Since boys and girls in the middle grades represent so many types of interests, are subject to so many impulses good and bad, and live in such different conditions of physical environment, it becomes necessary to use every legitimate appeal, immediate, intermediate, or remote, if they are to be reached and habituated to healthful living.

The use of demonstration in health education. In no field of learning does example make a greater appeal than in physical education. Here the teacher's practices should reflect his theories. A well-cared-for, well-trained body serves as a living model. Besides being an example, however, the teacher must possess both knowledge and the power of demonstration.

Teaching by demonstration may be used in the selection, the preparation, or the serving of food, in the choice, the care, or the use of clothing, and in the observance of hygienic laws. Whether the lesson be in simple gymnastics in the schoolroom, in the execution of some intricate play, or in teaching a child to swim, the teacher who can demonstrate the movement desired will be more effective in instruction than one who is not able to do so.

Lessons in home economics, manual training, industrial work, gardening, or agriculture lend themselves admirably to the use of the demonstration method, and at the same time yield a valuable by-product in the form of healthful exercise.

Teaching health principles by means of written or oral communication. Since the teaching of anatomy, hygiene, and physiology was first introduced into the schools, books have been used as one of the chief forms of instruction. Some books have been prepared in the form of texts, others as readers, and still others as guides or laboratory manuals. Two difficulties have appeared in the use of books: they have not contained suitable subject materials, and they have often led to recitation without understanding or application.

Book lessons explaining the parts, functions, or care of the body, giving sources, values, or uses of foods and clothing, presenting principles of school, home, or community hygiene, setting forth suitable individual or group exercises, or placing before pupils principles to be applied in gardening and the industrial arts, often save time and give opportunity to pupils for self-instruction. A book may explain to a pupil in the fourth grade conditions under which he is liable to take cold, to a pupil in the sixth grade the way to cook a certain vegetable or to bake a simple bread, to the baseball team how to lay out the grounds or play the game, to the young gardener how to prepare ground and how to plant and cultivate vegetables. It is abuse of printed materials in teaching that should be avoided, and not their proper use.

For children from nine to fifteen years old the formal lecture is of little use. The span of attention in pupils of this age is short. Appropriate materials for these grades should be presented in small units, while pupil participation should be encouraged. Reports made by pupils should be well prepared. Explanations should be straightforward and clear. The teacher who stumbles along, makes mistakes, or repeats, confuses pupils and destroys interest. Questions and answers should be clear-cut and to the point. Oral communication may be used in drill work, in directing laboratory exercises, in explanations, or in the discussion of difficult points in all phases of health education.

Graphic representation used in health education. Figures showing positions and proper relations of the parts of the body assist in teaching. Pictures of living children representing normal or abnormal traits are now used in many textbooks on health. The director of health education who placed on the walls of the schoolrooms the pictures of all children who passed the weekly inspection reported that "the device caused gallons of teeth to be filled."

Drawings showing successive positions of parts of the body in gymnastic exercises, proper location of kitchen furniture, heating and ventilating apparatus, the positions of players on the field, as well as the more formal plans used in lessons in elementary arts and crafts, may be mentioned as examples of graphic representation.

Data giving the normal heights, weights, and grades of pupils for different years, showing the lung capacity and reaction time of different pupils, presenting batting averages or individual records of achievements in different gymnastic feats, may be shown by graphs, thereby stimulating children to improvement in definite physical traits.

The use of apparatus in teaching health relationships. At first an attempt was made to teach lessons in health without the aid of either natural or artificial objects. Printed or oral forms of instruction prevailed. No manikins were used in teaching structure, nor were instruments available for testing function. No examinations were made, nor were corrective measures proposed by the schools. Height, weight, diet, clothing, and exercise were treated in short paragraphs in books which children were expected to learn by rote. Neither gymnasiums nor playgrounds were provided and, consequently, there was no demand for physical equipment.

No competent teacher of health education today would attempt to work without the use of scales, measuring rods, gymnasium or field equipment, samples of food and clothing, instruments for measuring vital capacity, etc. No longer is health education regarded a matter of theory. The establishment of certain habits has become the objective of physical education which can be attained only through the use of suitable equipment.

Use of the project in health education. In the establishment of bodily relationships the teacher is favored by the fact that much of the subject materials may be organized around definite problems or projects. If a child has bad teeth, defective eyesight, or a crooked spine, remedial processes may be applied and the progress in correction may be observed; if a pupil cannot chin the bar, run a distance in standard time, or swim across the pool, the effects of practice may be noted; if abnormal growths afflict the organs, they may be removed; if children are undernourished or overnourished, their diet may be adjusted; if pupils come to school with soiled hands, faces, or bodies, bathing facilities will be needed; if diseases infest the community, precautions and preventive measures may be applied; if bad habits of eating, sleeping, or working have been developed, causes may be located and conditions improved. In short, health education lends itself admirably to the project method of teaching, by means of which every individual child may be led to assist in improving his own physical welfare.

VIII. UNITS OF WORK IN HEALTH EDUCATION

Problems and Projects in Physiology and Hygiene[1]

A. A Project for Fourth-Grade Pupils

Proposal. To lead pupils to make and use a health score card.

Setting. It is assumed that the pupils have already had physical examinations or have learned something of their own bodily weaknesses. They have also received instruction, at home or at school, with regard to different elementary health habits.

Procedure. 1. Pupils may be requested to suggest common physical weaknesses that appear among children of their age. Their own physical examinations will often yield excellent data for consideration. Among others they may mention poor teeth, weak lungs, soft or undeveloped muscles, crooked spines, weak hearts, etc. The list named should be written on the board.

2. The teacher may ask for probable causes of weaknesses named. Skillful questions may lead to the enumeration of bad habits in eating, sleeping, bathing, caring for the body, breathing, exercise, etc. Suitable references on how to keep well may be used in the development of the topic.

3. Next, pupils may be requested to suggest rules for keeping in good health. Among others the following may be mentioned:

a. Sleep with windows open.
b. Keep face, ears, and hands clean.
c. Brush teeth.
d. Keep unclean things out of the mouth.

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[1] The problems and projects set up in this book for the purpose of illustrating materials and methods in the several fields should not be interpreted as representing the amount of work that should be covered in a single class period. They may require one or several days for solution.

e. Drink milk instead of coffee or tea.
f. Take deep breaths of fresh air.
g. Play or exercise in the open air.
h. Eat slowly.
i. Sit or stand erect.
j. Drink pure water.
k. Bathe the hands before meals.
l. Bathe the entire body at suitable times.

4. When this part of the work is completed, the construction of a health score card may be suggested. The items should be selected by the pupils. If too many items are included at first, the score card may prove a failure in application. The cards should be made up in attractive form with proper spaces and rulings for days of the week, etc.

5. The use of the cards may be stimulated by keeping records at school. Reports should be made at regular intervals, and the scores should be checked by pupils and teachers as faithfully as those in English or mathematics.

B. Problems for Pupils in the Sixth Grade

Purposes. To lead pupils to acquaint themselves with conditions that favor diseases, to learn the ways in which germs are carried from one person to another, to set up in their minds attitudes toward self-protection, and to assist them in organizing a set of "home guard" rules for their own use.

Setting. The problem may be introduced at "vaccination season," by reference to any epidemic that has swept the community, or in connection with "clean-up week."

Procedure. 1. Pupils may be invited to give their opinions as to the right of a school board to enforce vaccination upon all pupils, as to the right of the authorities to quarantine a family, or as to the right of a city council to force people to clean up their premises.

2. Diseases that have invaded the homes of pupils or the community may be enumerated.

3. The question as to how diseases may be communicated may lead to different investigations and discussions.

4. Pupils may be led to consider habits that help to scatter diseases. Among others may be included eating decayed food, drinking impure water or milk, sneezing or expectorating without protecting others, wearing clothes of other persons.

5. Microscopes and slides showing different disease germs will assist in creating interest. An exercise for the purpose of teaching pupils how to use the microscope may be introduced at this point.

6. The challenge, to find out how some germs fight others, may be used. This will bring up the uses of vaccination, antitoxin, etc.

7. The development of a feeling of personal responsibility may lead to the suggestion that a set of "home guard" rules might aid in self-protection against diseases. The pupils should be allowed to suggest the rules, which may include, among others, the following:

a. I will bathe my hands before meals.
b. I will not eat decayed food.
c. I will not drink impure water.
d. I will not expectorate on floors or pavements.
e. I will not handle soiled objects.
f. I will not wear the clothing of other people.
g. I will avoid coming in contact with people afflicted with contagious diseases.
h. I will assist in the destruction of disease-carrying insects.
i. I will exercise daily so as to be able to resist diseases, should they attack me.

8. After discussion the rules may be formulated and adopted by the class for daily use.

This problem easily leads to others, such as garbage disposal, care of market places, water supply, health departments, the location and control of health resorts, pollution of streams, and laws dealing with health problems. The pupils may also become interested in organizing a health department in the school to carry on health work about the buildings and grounds, and to coöperate with the health department in the community.

C. A Series of Eighth-Grade Lessons on the Vocal Organs

Aims. To lead pupils to become interested in the structure, uses, care, and development of the voice, and to cause them to apply to the improvement of their own vocal organs the principles learned.

Procedure. 1. As a means of motivating the work, pupils may be led to discuss the parts of an orchestra — string, reed, wind, and percussion instruments. They may not know the names for the parts, but they will be able to suggest the instruments used. These may be classified, and someone may be able to name the groups. Pupils may then be asked if the parts of an orchestra may be compared to any of the organs of voice. This will require an enumeration and study of the several organs. Finally, the strings and the reeds in the orchestra may be found to be similar to the vocal cords, the horns may be discovered to be similar to the cavities of the nose and mouth, while the bellows of an organ may be compared with the diaphragm. When pupils discover that they are "walking orchestras," interest in the structure of the several organs may be increased. Further interest may be aroused by requesting the class to explain why we have so few good vocalists. This is another way for approaching a study of the structure and complexity of the different voice organs.

2. The part of the project dealing with functions of the voice may be motivated by reference to boys' choirs, changes in the voices of members of the class, uses of the voice in different professions and lines of business, or the value of voices in various kinds of entertainment, as well as in common conversation.

3. In a study of the care of the voice, pupils may be stimulated to list and discuss changes, diseases, afflictions, or abuses of the vocal organs, such as lung troubles, catarrh, adenoids, colds, tonsillitis, sore throat, results of illness, strains, etc.

4. The development of a procedure for actual voice improvement should constitute the final stage of the study. For this part of the work, choral or glee clubs, literary societies, debating or dramatic clubs, and auditorium work will furnish means for carrying on the project.

Attention may be called to the fact that other systems of organs may be taken up in a similar manner; for example, the nervous system may be compared to a telegraph system, digestion to a manufacturing plant, the frame of the body to the frame of a building, the circulatory system to the water system of a town, etc.

UNITS OF WORK ON FOOD, CLOTHING, AND SHELTER

A. A Food Project for the Fifth Grade

Proposal. To interest boys and girls in the selection of the proper articles for a well-balanced morning meal, and to lead them to develop the habit of eating a suitable breakfast before entering upon the day's work.

Teaching procedure. 1. This project may be introduced by reference to the weight-height tables and physical-achievement tables of the pupils, if such have been made. It will be found that few pupils are satisfied with their own conditions and achievements. The question will soon arise as to how conditions may be improved. Different suggestions may be made by pupils. Among others the food supply may be named.

2. One week before the day for entering upon the project, pupils may be requested to keep account of the different articles served for breakfast in their homes.

3. In beginning the study, all articles reported, omitting duplicates, may be written on the board.

4. The problem of sameness and variety of food articles may be raised. This will lead to a classification of the articles mentioned by pupils, under their respective heads — fruits, cereals, eggs, meats, etc.

5. Lists may be enlarged to include any omitted but suitable articles that may easily be obtained in the community.

6. Following discussions of the values of the several articles, those decided to be injurious to children of the ages concerned should be erased from the list.

7. Each pupil may then be allowed to construct from the remaining articles a menu that he would most enjoy. The menus prepared by pupils may be read and discussed. Three or four of the most suitable ones may be placed on the board.

8. Pupils may be requested to use the menus, as far as possible, and report from time to time on certain articles or on full meals provided in the home.

This project may be followed by others on lunches, dinners, teas, etc.

B. A Project for Seventh-Grade Pupils

Ultimate purpose. To teach children to respect, protect, and care for their different articles of dress.

Immediate purpose. To lead pupils to discuss ways in which different articles of dress get out of order, to make a score card, and to score the conditions of their own clothing.

Procedure. 1. This project is assigned to the seventh grade for the reason that pupils of that age usually become more deeply interested than before in their own personal appearance and are therefore susceptible to the formation of good habits of dress.

2. The first lesson on the project may be taken up at the time of change from summer to winter clothing, or when the opposite change is made.

3. After some discussion of uses of clothing by the pupils, the matter of caring for clothing not in use may be raised. Observations with regard to clothes closets, wardrobes, and clothes chests may be easily drawn from the class. Methods of preparing clothes for storage may be suggested by pupils who have observed the practices in their homes.

4. Under care of clothing, the dangers arising from insects, dampness, rough treatment, diseases, or continuous wear may be enumerated.

5. If the use of health score cards is already familiar to the pupils, a score card for clothing may be suggested. This will lead to a discussion of items that should be considered. Among others the following may appear: hats out of shape, torn, soiled, or wrinkled; dress or coat soiled, torn, not pressed, buttons gone, odors present; shoes with holes, unpolished, out of shape, not properly laced; hose soiled, with holes, not adjusted, etc.

6. From the items enumerated and discussed a score card may be constructed. The project will not be completed until pupils use the score card in rating their own clothing. Reports should be made each month throughout the year. It should be remembered that habit formation is the chief purpose of this project. If results are obtained, time and attention will be required. Unless children are stimulated by proper incentives they will fail to establish desirable habits.

C. A Project for Ninth-Grade Pupils

Ultimate aim. To prepare children for actual participation in caring for the proper heating of their own homes.

Immediate aim. To teach children how to build a fire.

Procedure. 1. The experiences of Boy Scouts and Camp Fire Girls may be used as a starting point. While many children of this age know something of building fires, few know much about the qualities and costs of fuels or the principles underlying economical and successful fire-building.

2. Pupils may be allowed to give their experiences with fire-building. Successes and failures may be discussed.

3. A list of all fuels used in the community may be made. The list may include gas, oil, wood, coal, etc., depending upon the locality. Some discussion may follow with regard to sources and different kinds of woods, coals, oils, etc. A coöperative study may be made. Committees may be appointed to ascertain more fully the sources of the local fuel supply, the costs of the different fuels, the different kinds and costs of burners used in the community. Specimens of the fuels may be brought into the classroom.

4. The teacher may assist by suggesting such questions as Why does dry paper burn better than wet paper? Why do small pieces of wood kindle more readily than large pieces? Why does gas burn more easily than oil? Pupils who have had general science may be able to help with answers to these questions. References may be cited for readings and reports.

5. When the meaning of "kindling point" is understood, the arrangement of different fuels in order of their kindling points may be made.

6. If a container and fuels are available, the project may be completed at school; if not, pupils should be urged to complete the work at home and to report results.

This project readily leads to the study of problems dealing with different forms of ventilation, the construction and management of hot-air furnaces, and water systems used for heating purposes. While these problems are immediately related to bodily welfare, they may be used also to introduce problems dealing with industries. The uses of smokestacks, the construction of different kinds of ovens, and the manipulation of refineries and furnaces may be taken up in connection with other studies.

TEACHING GYMNASTICS, PLAYS, AND GAMES

No attempt will be made to outline lessons in gymnastics, plays, or games, for the reason that graded lessons in these fields are available in books[1] for all grades of the elementary schools. Furthermore, many setting-up exercises, plays, and games are equally suited to different grades.

The immediate and ultimate aims of gymnastics are to exercise and strengthen definite parts of the body. Rhythmic plays call for swinging, controlled movements that throw the entire body into graceful action and develop the coördination of different muscles. Games stimulate individual achievement and motivate supreme effort in special lines of physical endeavor.

The general procedures in teaching include explanations, demonstrations, memory devices for learning movements or rules, and repeated application. Many special forms of technic are used, but these are inherent in the particular movements desired. Saluting a partner, vaulting over a bar, holding or swinging a bat, receiving a pass, diving, or starting a race may be cited as examples.

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[1] Lydia Clark, *Physical Training for the Elementary Schools — Gymnastics, Games, and Rhythmic Plays.* Benj. H. Sanborn & Co. Also, Jessie H. Bancroft, *Games for the Playground, Home, School, and Gymnasium.* The Macmillan Company.

As means of stimulating different physical activities, different standards of achievement have been established. Many of these standards enable any individual to win distinction if he can make a certain number of points. By means of the established standards participants may be spurred on to higher and higher records of achievement.

Competitive games have long been used to stimulate individual or group effort; in some schools medals and badges are provided for all who can meet certain required standards. The city of Detroit[1] uses the decathlon for boys and the pentathlon for girls. Pupils are not permitted, however, to compete for honors in all the events until they reach the eighth grade.

The decathlon as used in Detroit includes the "chin," the "sit up," and the "dip," with any seven of the following events: 100-yard dash, standing broad-jump, running broad-jump, running high-jump, standing hop-step-and-jump, running hop-step-and-jump, shot put, overhead shot, 220-yard dash, pole vault, and 100-yard hurdles. The total possible score for the ten events is 1000 points. A gold medal is awarded for 860 points, a silver medal for 730 points, a bronze medal for 650 points. The pentathlon used for girls includes the standing broad-jump, the dash-and-throw, basketball throw, baseball throw, and 50-yard dash. Complete score cards show the values of different grades of achievement in the different events.

IX. CHAPTER SUMMARY

The materials and methods used in health education have been greatly improved within the last fifty years. The home, formerly regarded as entirely responsible for the bodies of children, failed to meet the needs, so the schools were asked to share in providing instruction in the laws of hygiene. For a quarter of a century the National Woman's Christian Temperance Union worked for the passage of state laws requiring the teaching of physiology and hygiene in the schools. This organization largely dominated the selection of materials taught with reference to hygiene from 1880 to 1900.

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[1] N. H. Pearl and H. E. Brown, *Health by Stunts.* The Macmillan Company, 1919.

A broader conception of the teaching of health relationships arose with the beginning of the twentieth century. Later the World War accentuated the need for more systematic physical training. With changes in materials came better methods of teaching. Within twenty-five years health education has been changed from the domain of theoretical instruction to the practical activities of everyday life. Many agencies are now called upon to contribute health materials, while the home and the school have united in an effort to give to growing children healthful, vigorous, and efficient bodily organisms.

It is not expected that a child will enter the fourth grade at nine or ten years of age without having made considerable progress in the study of bodily growth and health relationships. The first six years of his life will be spent in the home under the immediate care of parents. There he should learn, through informal instruction and practice, the elementary habits of personal hygiene. In the first two or three years of school life he will be called upon to make larger adjustments with regard to food, clothing, and bodily protection. Lunches away from home, clothing adjusted to travel, changes in weather, and new social conditions, with the consequent limitations placed upon personal freedom in meeting bodily needs, must now receive attention.

By the time a child reaches the fourth grade he should possess a considerable amount of knowledge relating to his growing body, its daily needs, and its proper care. He should already have established definite attitudes and practices, not only with regard to food, clothing, and shelter, but also with regard to health protection and physical exercise.

While not limited to the middle grades, four lines of operation seem necessary to the proper conduct of physical education in the schools. These are (1) complete diagnosis with provision for clinics; (2) adequate provision for the study and application of principles dealing with food, clothing, and shelter; (3) courses in formal instruction bearing upon important facts of anatomy and physiology and principles of hygiene; and (4) the study and practice of a complete system of physical exercises.

Physical changes coming in the early years of adolescence have a direct bearing upon food supply, the selection and use of clothing, and the attitude of children toward the decoration and care of their own bodies. These changes give excellent opportunity for the study and application of principles pertaining to health education.

Health instruction may be given by means of informal talks, or more formal lessons may be assigned for study and application. By the time the child reaches the fourth grade he is mentally and physically prepared for the study of larger health problems. These more formal lessons should furnish the foundation upon which the superstructure of health habits of future life is to be built.

Physical exercises are usually classified as gymnastics, games, or plays. Gymnastics are used for the development of particular parts of the body, games give freedom in the coordination of muscles in the larger movements, while play gives still greater opportunity for individual choice in action.

The different fields of physical education readily lend themselves to the most natural, and therefore the most effective, types of teaching. These are teaching by demonstration, through oral or written communication, by means of graphic representation and the use of objective materials, and through the employment of challenges represented by problems or projects. Motivation for performance in different phases of the work may be secured by appeal to various native impulses. The application of established standards to different activities will often engender enthusiasm in the work. It is therefore proposed that the materials for teaching health principles shall be organized largely around projects that may be developed in connection with the common practices of daily life.

EXERCISES

1. Name the vital organs of the body and explain their interdependence.

2. Compare the methods used by "medicine men" of early times with those employed by physicians today.

3. Make a study of the work of the National Woman's Christian Temperance Union.

4. Compare the topics found in a physiology published fifty years ago with the ones included in a similar textbook of the present day.

5. Trace the changes made in the methods for teaching physiology and hygiene within the last fifty years.

6. Make a list of hygienic habits that should be well established in the life of a child ten years of age.

7. Outline work that parent-teacher associations may do in uniting the home and the school in furthering the practical phases of health education.

8. Discuss the importance of teaching children to enjoy as many articles of food as possible.

9. For debate: *Resolved*, That changes in fashions among civilized peoples contribute, on the whole, to physical welfare.

10. Make a list of ten rules that should be observed in the practice of good table manners.

11. Obtain prices from local stores and estimate the costs of school suits for boys and girls twelve years of age.

12. Make lists of suitable indoor and outdoor games for children from nine to fifteen years of age.

13. Outline the theories advanced to explain why people play.

14. Discuss the relative importance of books and physical equipment as means for teaching health habits.

15. Outline five projects each in food, clothing, and exercise for pupils in the middle grades.

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Report of Joint Committee on Health Education. Prepared under the direction of Dr. Thomas D. Wood, Teachers College, Columbia University.

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CHAPTER VII

THE ESTABLISHMENT OF LANGUAGE RELATIONSHIPS

I. EARLIER MATERIALS AND METHODS

The development of language forms. A civilization cannot be developed without the organization of an adequate language for its embodiment. When the Greek and Roman peoples were expanding their institutions they called into existence new words, new forms of expression, and new types of discourse.

While gesticulation had long been used by uncivilized man, in the hands of civilization it became the foundation of dramatic art. Simple narration and description existed before the dawn of history, but historians developed these into settled literary types. The first attempts at exposition and argumentation date back to the first efforts of man to explain a fact or argue a cause, but it required generations of thinkers to organize these into systematic forms of expression. The sentence, the structure of the paragraph, and the types of discourse were brought into existence to meet definite needs in the communication of ideas.

Only growing civilizations or living languages call for new words or additional means of expression. Furthermore, new additions to language are more likely to be made in the fluid state of oral communication than through writing.

The study of dead languages. Just as languages clothe the spirits of civilizations while living, so they become the shrouds in which the records of civilizations are buried. After centuries forgotten ideas may be resurrected if only the keys to the languages in which they are entombed can be recovered.

The Greeks and Romans, while developing great civilizations, clothed them in strong and beautiful languages. By and by those ancient peoples failed to live up to their ideals, so their nations perished. When their ideals were no longer used, the languages in which these were embodied ceased to be living tongues.

When much of ancient culture had been buried for nearly a thousand years, toward the end of the Dark Ages a few aspiring spirits who yearned for better things began to study the ancient languages. Soon they began to unlock the tombs in which the old ideals were buried. This movement is known in history as the Renaissance, or the rebirth of ancient literature, science, and art.

To unlock the tombs of ancient wisdom it was necessary to study the structure of languages (that is, the forms of words, the structure of sentences, and the construction of paragraphs). Thus grammar, rhetoric, and logic became the leading subjects of the schools. The mastery of declensions and conjugations, the learning of rules with their application to sentence structure, or the translation from one language to another, occupied much of the learner's time. The object was to extract, understand, and appropriate the thoughts of others rather than to develop or express original ideas.

Methods of teaching dead languages transferred to living tongues. Beginning with the Latin schools, founded in the early part of the sixteenth century and continuing for four hundred years, the study of the classical languages played a leading part in formal education. John Sturm's school at Strassburg, founded in 1538, received pupils at six years of age, who were required immediately to take up the study of Latin. The course covered ten years, seven of which were spent in mastering the language and three in acquiring a good style. According to Russell,[1] Latin was read, spoken, or written, exclusively, four hours a day for ten years.

As time passed, less and less attention was given to speaking the language and more and more time was spent on translation, until the ancient languages again became dead so far as methods of teaching were concerned. Forms were placed before meanings, rules preceded application, and content was made a secondary consideration. Because of the methods used, pupils often failed to master the structure of the language; consequently they never came to an appreciation of the literature.

II. THE DEVELOPMENT OF THE VERNACULAR

The vernacular in foreign countries. At the very time that Latin and Greek were at the peak of their popularity as a result of the Renaissance, there were those who insisted that the mother tongue should not be neglected. Even before the ancient languages had secured a strong foothold in the schools, Dante, the great Italian, wrote a book, *The Banquet*, in which he defended the use of the vernacular. The translation of the Bible into the vernacular, in order that the Scriptures might be made accessible to all, became a significant factor in the development of elementary education in the sixteenth and seventeenth centuries.

It is not essential to the present purpose to trace the tardy appearance of the study of the vernacular in the different civilized countries of Europe. Reference is made to the rise of the vernacular in European nations for the reason that it was there that competition between the dead and the living languages arose; it is in those countries also that the ancient languages have furnished the greatest obstacle to the teaching of the mother tongues in the schools.

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[1] James E. Russell, *German Higher Schools*, pp. 42–43.

The development of the vernacular in the United States. In the early colonial days children in the primary schools were taught to read that they might understand the Bible; in the middle schools they studied Latin and Greek that they might be prepared for college. The materials and methods used were of English origin but followed closely the types employed in other European countries.

A serious study of English in the middle schools of this country was first proposed by Benjamin Franklin in his plan for an academy in 1749. Franklin sketched for the English division of his academy a program which included the following outline of courses:[1] the first year, orthography, rules of grammar, and short selections including fables and stories; the second year, "short pieces like those of the *Spectator*, with some grammatical study and an account of the meaning of words, of sentences, and of the piece as a whole"; in the third year special attention was to be given to rhetoric and public speaking; composition was prescribed especially for the fourth year; in the fifth year the pupils were to write compositions both in prose and verse and to read certain selections; in the sixth year, studies begun were to be continued, and readings from the leading English authors along with translations of Greek and Roman writers were to be studied. It was proposed that pupils who could read and write at nine or ten years of age might be admitted to the new school. Brown states: "Franklin would gladly have made this academy an English school pure and simple. But he yielded to men of wealth and learning, whose coöperation was needed, and included both ancient and modern languages."

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[1] E. E. Brown, *The Making of our Middle Schools*, pp. 188–189. Reprinted by permission of Longmans, Green & Co., Publishers.

The courses in English as outlined by Franklin were little improved for more than a century, except that, as the elementary and high schools were linked together and lengthened, the work proposed was spread over more years. Almost until the present time the study of English has been broken into the same general parts — orthography, reading, grammar, rhetoric, public speaking, and literature. Although the classical languages continued to dominate language-teaching long after the modern high school was organized, the vernacular continued to gain ground until today it is made the basic course in all modern elementary and secondary schools in the United States.

III. THE APPEARANCE OF TEXTBOOKS

The hornbook, primer, Psalter, Testament, and Bible. Parker states that John Locke reported in 1690 that the textbooks then used in English elementary schools were the hornbook, primer, Psalter, Testament, and Bible. Parker adds,[1] "These same books continued to be the regular textbooks in American elementary schools until the period from 1750 to 1800, when they began to be displaced by 'spelling books.'"

The hornbook was a wooden paddle covered by a sheet of paper which was protected by a covering of transparent horn. On the paper were inscribed the alphabet, some nonsense syllables, and the Lord's Prayer. The hornbook was to be followed by the primer, which contained the Creed, the Lord's Prayer, the Ten Commandments, and a few psalms.

The *New England Primer*, patterned after the English books, appeared about 1690 and continued for a hundred years to be the chief book for beginners in reading. The Psalter, the Testament, and the Bible were used as pupils became more advanced in reading. These books, entirely religious, reflect the chief purpose in elementary education both in Europe and America until almost the beginning of the nineteenth century.

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[1] S. C. Parker, *A Textbook in the History of Modern Elementary Education*, pp. 72 ff. Ginn and Company, Publishers.

The spelling book. The first spelling book, according to Parker,[1] was published by Edmund Coote about 1596. This book purported to teach "the most easie, short and perfect order of distinct readings and true writings our English tonge."

Among early spelling books was Dilworth's *New Guide to the English Tongue*, published in England in 1740. This book was used in New England during the middle of the eighteenth century. It was followed in 1783 by Webster's speller, which soon became the leading textbook in the primary schools. This work continued to be used for almost a century. Spelling soon became the most popular exercise of the school. The new book contained more words and more secular reading matter than the primer, which it supplanted.

Grammar, rhetoric, and literature. The first English grammar to gain wide attention was written by Lindley Murray and published in 1795. Brown[2] concludes that this book "gave the first definite direction to this department of study."

The lines separating grammar, rhetoric, and composition have changed from century to century. Grammar came to include parts of rhetoric, and rhetoric in turn included letter-writing and composition. Cubberley states that textbooks on letter-writing began to appear by the eleventh century. With the development of English grammar in the latter part of the eighteenth century, composition experienced a considerable growth.

In the latter part of the eighteenth century a change was made from strictly religious literature to a more secular type.

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[1] S. C. Parker, *A Textbook in the History of Modern Elementary Education*, pp. 78 ff. Ginn and Company, Publishers.

[2] E. E. Brown, *The Making of our Middle Schools*, pp. 234–235.

Webster's *American Selections or Third Part* (published in 1784) and his *Columbian Orator* contained a "little more of eighteenth-century literature." Thus it may be seen that by the beginning of the nineteenth century textbooks in English were available for spelling, reading, grammar, composition, rhetoric, and literature.

The methods of teaching were largely copied from the Latin-grammar schools. The objectives were to produce good spellers, fluent readers, expert grammarians, formal speakers, and to drill into the minds of children religious creeds, proverbs, and quotations from religious or secular writers. In order to realize these aims the memorized recitation was largely used.

IV. MATERIALS AND METHODS IN ENGLISH IN THE NINETEENTH CENTURY

The first part of the century. From 1800 to 1840 Murray's grammar and Webster's speller continued to be the leading texts for teaching English in the middle grades.

The 1823 edition of the grammar covered not only the rudiments of what is now known as grammar, but also the elements of composition and rhetoric. The article was treated as the ninth part of speech. The tenses were named present, imperfect, perfect, pluperfect, first and second future. A considerable part of the book was given to figures of speech. Rules of rhetoric were placed in the appendix. Latin prefixes were treated and declensions in Latin were included.

Webster's spelling book, which served also as a reader, reflects certain definite types of materials and methods. Nonsense syllables are used as exercises in phonetics; words having the same number of syllables and accented alike are arranged in columns; the sentences in a reading lesson bear no relation to each other; and lessons are numbered in both the Arabic and the Roman notation. A few illustrated fables add a little variety to the book.

New series of textbooks in spelling, reading, grammar, and elementary composition. A series of readers by S. G. Goodrich, appearing somewhat earlier but revised in 1846, marked a distinct change in the form and substance of subject matter in reading. The subject matter previously used consisted at first of religious teachings, disconnected sentences, or definitions, but later included proverbs and fables. The Goodrich series of five readers contained both prose and poetry. Story and dialogue selections were supposedly graded to meet the abilities of different pupils. The lessons were usually preceded by a few words with their definitions and were followed by questions and answers on the matter read.

However, the greatest contribution in the line of reading materials near the middle of the nineteenth century was made by William H. McGuffey, who prepared eleven different books on spelling, reading, and speaking.

McGuffey is reputed to have been the first author to test the selections chosen for his books by first submitting them to children of different ages. If the selections proved uninteresting, they either were discarded or were moved up or down the series until a distinct appeal became apparent.

The *McGuffey speller* bore certain earmarks of its great predecessor, the Webster speller, but the readers and speakers broke new ground. A richer and more varied content in subject matter and a freer and more stimulating style of oral expression were provided in these epoch-making books. So fascinating were the selections in the readers that children often delighted not only in reading them but in reciting them aloud. There are those now living who can still render many of the selections from memory, although copies of the books are no longer easily obtainable.

Another significant step in the development of better materials and methods in the teaching of English in the middle grades is reflected in the following quotation taken from the preface of Quackenbos's *First Lessons in Composition*, published in 1851:

> A County Superintendent of common schools, speaking of the important branch of composition, in a communication bearing date July 27, 1844, uses the following language: "For a long time I have noticed with regret the almost entire neglect of the art of original composition in our common schools, and the want of a proper textbook upon this essential branch of education. Hundreds graduate from our common schools with no well-defined ideas of the construction of our language." The writer might have gone further, and said that multitudes graduate, not only from common schools, but from some of our best private institutions utterly destitute of all practical acquaintance with the subject; that to many such the composition of a simple letter is irksome, to some an almost impossible task.

The author then sets forth the doctrine that it is the application of grammar that makes it useful, that parsing should be subordinate to composing, and that analysis is not so important as synthesis. He attributes the conditions described to the lack of any suitable textbook for pupils from nine to twelve years of age. He then offers his *First Lessons in Composition* as a book which presupposes no knowledge of grammar, but which will lead the pupils, "by easy and pleasant steps, into that all-important but hitherto generally neglected art."

The author affirms that in his book grammar and composition are developed together, that the inductive system is used, and that copious illustrations ("not taken, as has hitherto been the practice, from the time-honored textbook of Murray") are used. In this book may be found in simplified form some treatment of the principal topics appearing in leading grammars, composition books, and rhetorics of the next fifty years. Although this book, compared with present-day standards, seems pedantic in the so-called inductive approach to composition and falls far short of being suited to our modern procedure for teaching composition, it nevertheless registers a commendable step beyond the practices of the first half of the nineteenth century.

We pass to developments in language instruction in the last half of the nineteenth century with Murray's grammar yielding to series of language books, Webster's speller being superseded by an enlarged spelling book and readers adapted to different grades of advancement, with practical composition slowly blending with grammatical and rhetorical rules, and with books on oral speech appearing in the schools.

The newer books on grammar and composition usually professed to use the inductive procedure, but an examination of the lessons proposed will show that the books of that period leave much to be desired when compared to standards of modern times.

Important changes in materials and methods in the last half of the nineteenth century. After the appearance of a new spelling book, series of readers, graded lessons in grammar, and a book on elementary composition, near the middle of the last century, came an ever-increasing flow of books on every phase of English instruction.

Such spelling books as that of McGuffey, largely extensions of Webster's speller, gave way by the last quarter of the century to such books as Reed's *Word Lessons*, described as "A Complete Speller Adapted for Use in the Higher Primary, Intermediate, and Grammar Grades, Designed to teach the correct Spelling, Pronunciation, and Use of such words only as are most common in current literature, and as are most likely to be Misspelled, Mispronounced, or Misused, and to awaken new interest in the study of Synonyms and of Word-Analysis."[1] This book includes script as well as print, contains lessons on important abbreviations and suffixes, treats homonyms and synonyms, stresses definitions and correct use of words, and gives exercises on word analysis and word-building. The words are grouped according to meaning; for example, lessons are given under such headings as "Parts of the Body," "What we Wear"; and so on. Special directions are given for teaching different lessons.

About the middle of the last century, as already stated, series of graded readers began to appear. In the last half of the century, readers came to be supplemented or superseded by the use of classics. The growing demand for more reading materials led to the employment of more than one set of readers in the primary grades and to the use of "literary readers" and classics in the intermediate and high-school grades.

Interest in reading and speaking is evidenced by the appearance of such books as the following: *Webster's Reciter*,[2] *Little Folks' Speaker*, *Youthful Speaker*, and *Progressive Speaker*.

The incomplete sentence in teaching grammatical forms had been in use for some time; stress upon "false syntax," the correction of errors in sentence structure, and the use of the "diagram" appeared in the third quarter of the century. In the preface to Harvey's *Elementary Grammar and Composition*[3] the following statement appears: "The author would call especial attention to the exercises in false syntax." Later the use of false syntax was challenged by Mary F. Hyde, who wrote in her *Practical Lessons in the Use of English* (1888): "Incorrect forms for correction are not given.

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[1] Reed, *Word Lessons*, title-page. 1893.

[2] The Webster Standard Series. Published by Robert M. DeWitt, 1872.

[3] Published by Van Antwerp, Bragg and Company, 1880.

It is believed that incorrect forms should not be placed before children." The use of "false syntax" was thus challenged.

For years some form of the diagram appeared in practically all textbooks in grammar. One of the most complete systems of diagraming may be found in Reed and Kellogg's *Elementary English Grammar* and *Higher Lessons in English.*[1] By 1910 the diagram as a means of teaching sentence structure was omitted from many textbooks. More recently there are signs of a reinstatement of the diagram in a less detailed form.

At least in theory, practical composition was more stressed toward the end of the century. Swinton, in his *Manual of English Composition,*[2] wrote:

> In the plan here adopted, composition is begun with the very commencement of the study, and is carried on *pari passu* with the development of rules and principles. It is a matter of common experience that children's power of producing, in an empirical way, is much in advance of their knowledge of the rationale of writing; hence, in the present work, pupils are not kept back from the improving exercise of actual composition until they have mastered the complicated details of rhetorical theory.

The use of pictures as a basis for composition work is indicated in the following statement: "In composition the pupil is first taught to tell what he sees in a picture, and to ask questions concerning the objects represented in it."[3]

As further evidence of the development of a more favorable attitude toward vitalized composition the following statement is made:

> Whatever the pupil is interested in, whether it be a topic connected with his reading, geography, history, or some other lesson,

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[1] Published by Clark and Maynard, 1889.

[2] William Swinton, *A School Manual of English Composition.* Harper & Brothers, 1883.

[3] Thomas W. Harvey, *Elementary Grammar and Composition,* p. iii.

will afford him a good subject for composition. Topics of local or of general interest will have a new meaning to the pupil if he writes about them.[1]

Before the end of the century another phase of instruction in English began to appear in the form of histories of English and American literature. A good example of texts prepared for the middle grades may be found in Swineford's *Literature for Beginners*, published in 1883. The statement is made in the preface that the book is intended to give beginners a correct knowledge of the lives and writings of the leading British and American authors and to create a love for literature so that its study may become a pleasure rather than a task. Brief biographies of authors with titles of their important writings are presented. Many short extracts from masterpieces are included. These are called "Gems of Thought." No complete selections may be found in the book. The attempt made to interest children in reading by giving to them brief outlines of the history of literature did not meet with success. In common with the method used in other phases of instruction in English, children are now presented with the concrete before undertaking the abstract.

In short, the nineteenth century witnessed a remarkable change in materials and methods used in the teaching of English. Spelling books were greatly modified; series of readers and editions of the classics were placed in the hands of pupils; grammars introduced the inductive procedure; composition books recognized the interests of children as an important factor in instruction; books on public speaking, forerunners of present-day works on oral English, appeared; finally, texts on the histories of English and American literature were prepared for the schools.

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[1] Mary F. Hyde, *Practical Lessons in the Use of English for Grammar Schools*, p. v.

But not all the materials and methods proposed for teaching English in the last century proved worthy of perpetuation. To expect this would be to argue infallibility in a great band of teachers seeking for better things. However, out of the efforts of the last century have come many of the fundamental principles of materials and methods used in teaching English in the middle grades today.

Recent developments of instruction in English. The constantly increasing volume of knowledge has compelled the reduction of subject matter proposed for the schools to minimum essentials. Instead of giving to the child in the primary and middle grades some twelve thousand words to spell, the quantity has been reduced to less than half that number. Furthermore, instead of making a haphazard selection, attempts have been made to offer to children only such words as appear in common usage. Investigators have made word lists, collected from different sources. Jones [1] undertook to ascertain what words children in different grades use in written speech; Ayres [2] studied personal and business letters; Cook and O'Shea [3] analyzed the vocabularies of social and family correspondence; reading vocabularies of children were checked by Thorndike; [4] and Horn and Ashbaugh [5] have compiled 4578 words selected from different studies and assigned them to the appropriate grades in the elementary schools. Thus it may be seen that the materials and methods used have been changed within the last quarter century.

Within the last twenty-five years reading materials for the middle grades have also been changed in both kinds and amounts required. While suitable classics are still included in reading lists, much contemporary literature is now used. Certain specialized forms of reading matter are presented under such titles as *Nature Readers*, *Art Literature Readers*, *Vocational Readers*, etc. Children today frequently read as much in a month as they formerly read in an entire school term. The development of the pupil's taste for suitable reading materials is now regarded as one of the chief aims of teaching English in the middle grades.

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[1] W. F. Jones, *Concrete Investigation of the Materials of English Spelling.* 1913.

[2] L. P. Ayres, *The Spelling Vocabularies of Personal and Business Letters.* 1912.

[3] W. A. Cook and M. V. O'Shea, *The Child and his Spelling.* 1914.

[4] E. L. Thorndike, "Word Knowledge in the Elementary School," *Teachers College Record*, Vol. XXII, pp. 334–370.

[5] Ernest Horn and Ernest J. Ashbaugh, *Horn-Ashbaugh Speller.* 1920.

Whereas good oral reading was formerly looked upon as the principal object to be attained in reading classes, in recent years silent reading and reading for appreciation are considered of most importance. Series of readers[1] and teachers' manuals[2] are now available for use in teaching pupils how to gather the thought and enjoy the contents of the printed or written page without actually reading aloud.

Another important change in language instruction in recent times has been the blending of grammar with oral and written composition. Professor C. Alphonso Smith wrote in 1919:

> If the paragraph may be considered the discovery of the last quarter of the nineteenth century the primacy of spoken English is the corresponding discovery of the first quarter of the twentieth century. . . . Literature, composition, and grammar should go together. To separate them is to deprive literature of its support, composition of its inspiration, and grammar of its goal.[3]

Just as word lists for spelling have been constructed from everyday usage, so have the common errors in spoken and written language been made the subject matter for instruction in grammar and composition. The attempt to blend the different phases of instruction is well reflected in the titles of various series of English textbooks, such as *Good English*, *Lessons in English*, *Oral and Written English*, *Everyday English*, and *English To-day*.

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[1] Ernest Horn and Others, *The Learn to Study Readers*; Alberta Walker and Mary R. Parkman, *The Study Readers*.

[2] Emma Miller Bolenius, *Teachers' Manual of Silent and Oral Reading*.

[3] C. Alphonso Smith and Lida B. McMurry, *Language Series*, Book III, p. 4. Reprinted by permission of the Johnson Publishing Company, Publishers.

The changes, then, in materials and methods for teaching English to pupils in the middle grades in the present century have occurred in the substitution of a usable vocabulary for long lists of uncommon words in spelling, in raising silent reading to the same rank of importance as oral reading, in a recognition of oral composition as a proper prerequisite for teaching written forms, in the incorporation of instruction in the principles of grammar along with oral and written composition, in the acceptance of the everyday experiences as proper materials for oral and written expression and language study, in the inclusion of present-day writings along with suitable classics for the development of children's interests and tastes in reading, and finally in a recognition of the fact that language habits result only from the use of language and not from abstract discussions of grammar, rhetoric, or histories of literature.

V. FOREIGN LANGUAGES IN THE MIDDLE GRADES

The ancient languages. Because the ancient languages have not been spoken generally for some hundreds of years, they will continue to be taught largely by the indirect method. Since this is true, there seems to be little need for beginning a formal study of these in the lower grades, as was formerly the practice. Latin still retains a place in the high school. In preparation for the work there an introductory or exploratory course may well be included in the seventh or eighth grade.

Modern languages. Modern materials and methods for teaching foreign living tongues to American children should be similar to those used in giving instruction in the vernacular. Psychologically, there is as much reason for beginning a living foreign language at an early age as there is for giving attention to the mother tongue. It is only the relatively lower value of a foreign tongue as compared to the vernacular that will justify the postponement of foreign languages to the upper division of the middle grades. For those who expect to speak a foreign language a beginning should be made while the organs of voice are still susceptible to adjustment.

VI. LANGUAGE MATERIALS AND METHODS NOW PROPOSED

Changes in aims and procedures. Language is more than a mechanical tool. A mechanical tool is not a part of the material on which it operates. Language is so intimately related to thought that it becomes lifeless when studied apart from use. This accounts for the fact that the use of nonsense syllables in spelling, detailed classification of parts of speech, extensive use of the diagram, and the employment of mere fragments in teaching reading are passing from modern textbooks. Even in the so-called mechanical processes of spelling and memorizing, facility in learning is increased by an understanding of the meaning of the words to be spelled or the selections to be committed to memory.

A better understanding of the psychology of language relationships has led to a complete reorganization of materials and methods for language instruction. Instead of requiring pupils to spell thousands of disconnected or unrelated words, they are now taught to spell their own written vocabularies. Instead of beginning with rules governing different types of composition, pupils are invited to write letters or to express in oral or written form their own ideas, as well as ideas gained from others or from books. Instead of spending hours drawling over disconnected sentences, platitudes, or selections beyond their comprehension, they are now encouraged to read silently materials within their mental grasp with a view to expressing the content in their own spoken or written words. They are also led to read their own productions aloud with understanding and feeling. Instead of parsing words in classical selections or mending pages of false syntax, pupils are now turned to the correction of gross errors in their own oral and written speech. Instead of being required to commit to memory assignments for future understanding and enjoyment, a liberal number of suitable selections of both poetry and prose are now prepared and recited before the class, or on special occasions, with interest and pleasure. In short, while spelling, reading, writing, grammar, composition, and literature are still the appropriate phases of language instruction, they are now blended together in the attainment of the only aims for which language instruction should exist — to gain ideas or to communicate ideas.

Bases for the selection of language materials. Centuries were required to formulate the basic principle that the abstract is best taught to young people when it is preceded by the concrete. Forms of language are more easily learned when they are filled with content than when they are separated from all meaning; that is to say, words spelled apart from their meaning, sentences read without understanding, rules of grammar committed without application, principles of composition recited without illustration, and descriptions of literature, apart from first-hand examination, all fail to develop a language feeling which is necessary to language improvement.

At least three distinct bases have been used in the development of language instruction. For a long time it was believed that a command of language might be obtained by learning the different constituent parts of words, sentences, and paragraphs. It was thought that if syllables, words, phrases, clauses, and sentences were studied separately, they might then be brought together in everyday use, as bricks, steel, and lumber are assembled in the construction of a building. In accordance with this conception children were caused to study first the letters of the alphabet, next the spelling of words, and then the reading of disconnected sentences. The grammar of the middle grades formerly consisted of a study of the ways in which letters are put together to form words, of the classification of words into parts of speech, of the divisions of sentences into words, phrases, and clauses, or of exercises dealing with these several fragments of language structure. Neither oral nor written composition, except in an abbreviated form of the completion-sentence or the construction of bare illustrations of rules, appeared in language instruction. The use of fragments as a basis for the development of correct usage proved a failure.

The second basis adopted for language instruction included the use of definitions in spelling, the word method in reading, the language-grammar or grammar-composition combinations in writing, and the use of readers and classics in the study of literature. While the subject matter and methods of this period reflected a forward movement, results still fell short of practical needs. The words proposed for spelling reached far beyond the pupil's vocabulary, the grammar taught was still far too technical, the compositions were often based on abstract subjects or classics with which the pupils were unfamiliar, and the literary selections used were often beyond the comprehension of the learners. A distinct characteristic of the materials and methods of this period was reflected in the use of models: models for word-building, models for the analysis of sentences, models for composition, and the use of classics as models in literature.

The third or latest proposal for the selection of language materials is based upon the more immediate interests, needs, and capacities of the pupils under instruction. This basis makes the written vocabularies of children in the different grades the subject matter of spelling; the common mistakes in oral and written sentence structure of everyday life the subject matter in grammar; topics of inherent interest to children themselves the foundation for composition work; and stories, poems, biographies, and fiction both classic and contemporary, within the pupils' comprehension, the reading materials of the several grades.

It is not maintained that the transition from one basis to another has been abrupt; indeed, many intermediate steps between the first and second bases as well as between the second and third may be observed by an examination of textbooks published within the last century. But in general the three fundamental principles controlling the selection of language materials have been based upon the following beliefs: first, that pupils might be made proficient in the use of English by studying the factors of which language is composed apart from use; secondly, that command of language might be obtained by studying and copying models; thirdly, that the materials used, understood, and enjoyed by the learners furnish the best means for language instruction.

Language materials for the middle grades. The language materials for the middle grades should include, in general, the thought matter of pupils, — whether this be an outgrowth of home or school experiences, the results of the study of other school subjects, or the form and use of language itself. The more formal aspects of language will include reading materials, oral and written composition, spelling, handwriting, grammar, and the enjoyment and evaluation of literary productions possessing inspiration and high ideals.

Materials in reading. Reading materials may be roughly divided into three classes: textbooks and references on the several school subjects, such as geography, mathematics, or physiology, readers containing selections of prose and poetry adapted to the ages of the children, and general literature.

The first type of materials, which requires careful study, lends itself readily to silent reading, the second type is more frequently used in teaching the mechanics of oral or written expression, and the third type (often read but once, either silently or orally) yields information, stimulation, or simply pleasurable emotion. All three types are essential to proper mental development.

The imaginations of boys and girls in the middle grades may be stirred by myths, legends, and stories of native or foreign lands. Poetry makes a strong appeal at this time of life because of its rhythm and imagery. Dialogue not only arouses interest but furnishes an excellent instrument for the development of oral expression. Humorous selections add variety and stimulate the desire to conquer the mechanics of reading. Hero worship, strong in children of this age, calls for short biographies, both real and fictitious. It must not be concluded, however, that legendary material, poetry, and fiction are the only forms of reading that appeal to young pupils. Accounts of voyages, descriptions of animals or plants, history stories, or descriptions of important industries, when presented in suitable language, may be made to grip the interests of children from nine to fifteen years of age.

Methods in reading. The first essential in teaching reading is a teacher who loves good literature and who reads well herself. When suitable materials have been placed before pupils, the next step is to provide proper motivation for the reading process. This may be done by creating a need for reading, by stimulating an interest, or by providing a reward for accomplishment. This reward may appear in the personal use of knowledge gained, in æsthetic enjoyment, or in the power and privilege of communication. On the receiving side listening, observing, and silent reading prevail; on the giving side oral reading, recitation, and dramatization may be used. One author names three kinds of reading: silent, oral, and sight reading. Sight reading merely excludes previous study and may be silent or oral. The demand for silent reading steadily increases from grade to grade. Its importance in practical life greatly exceeds that of oral reading. Miss Bolenius says: "A man speaks a hundred times to the once that he writes; he reads silently a thousand times to the once that he reads aloud."

In silent reading certain difficulties may appear. The vocabulary or content may be too advanced for the reader; physical difficulties, such as eye or lip movements, may impede progress; or pupils may read wrong meanings into the sentences placed before them. To meet these difficulties, teachers may call attention to difficult words or phrases, assist with the interpretation of difficult parts, point out the need for eliminating lip movements, explain the meaning of "eye swing" and "eyeful," encourage more rapid eye movement, and lead pupils to careful interpretation by setting questions for guidance in preparing lessons. Silent reading may be motivated by requesting pupils to paraphrase or summarize an assignment, by requiring an oral report of the selection read, or by allowing a dramatization to be made of the thought obtained.

Oral reading, recitation or declamation, and dramatization are employed to give information or pleasure to others or for self-enjoyment. Except in some types of oral reading, these exercises should be preceded by silent study of the selection.

Since the vocal organs, facial expression, and gesticulation become the important factors in oral and dramatic expression, many difficulties may be encountered in teaching. The structure of the vocal organs may be defective; growths, diseases, or nervous troubles may interfere with proper vocalization; or lack of mental or physical vigor may destroy that animation which is necessary for reading and speaking. Good oral readers or speakers, like good singers, must first possess healthy, well-developed vocal organs. The first duty of the teacher of reading is to make an analysis of each pupil's difficulties with speech in order to determine suitable remedial steps to be taken.

In addition to physical impediments, certain mental difficulties may be encountered in teaching oral reading. Among the more prominent of these may be mentioned lack of ability in comprehension or in appreciation; poor enunciation, articulation, or pronunciation; or a tendency to omit, insert, repeat, or substitute words. Analysis must be made of these difficulties before suitable remedies can be prescribed. Corrections cannot be intelligently made unless the specific troubles are located. Finally, drill upon certain phases of speech will be necessary.

Since oral reading has for its chief purpose the instruction or entertainment of others, the greatest means of motivation is found in the provision of a suitable audience. Children should be encouraged to seek an audience for reading among members of the family at home, among classmates at school, before pupils in other schoolrooms, on holiday programs, before public audiences, or wherever proper opportunity may occur.

Dramatization has been found one of the very best means for stimulating expression. In the first place, it requires an understanding of the selection to be presented. It allows certain freedom of movement, thus satisfying an instinctive impulse in young people. Special dress may be used at times to arouse interest in artistic production or to stimulate drill on oral speech.

The subject matter of oral composition. The subject matter of oral composition includes discussion of both content and form. Content may be drawn from many fields. The following sources may be mentioned: activities of home and school life, plays and games, holiday excursions or summer vacations, various school subjects, real or imaginary travels, natural scenery, pictures, current events, animals and plants, various industries, plans for the future, or materials drawn from books, such as fables, dialogues, biographies, and plays.

Methods in oral composition. The first consideration in preparation for oral composition is the creation of a genuine desire for communication. Children will prepare material more readily if they are allowed to profit by its presentation. Here the social impulses of self-expression, showing off, and rivalry may be used. To tell something that no one else knows; to make a better report than other members of the group; to be listened to with respect by classmates; to be praised for a good story, a vivid description, a clear statement, or a convincing argument, — these are rewards that make a strong appeal.

The oral composition lesson is frequently looked upon as an exercise requiring no preparation. Pupils are sometimes permitted to stand in a slovenly manner, mumble over worthless materials presented in disconnected form, and then fall into their seats with a sigh of relief, — to the disgust of their auditors. Such performance is often the result of inadequate preparation.

Proper preparation will include determination of the form of discourse to be used; that is, whether the exercise is to consist of the description of some object or bit of scenery, the narration of some experience, the explanation of some game, or the presentation of an argument for larger playgrounds. Pupils should be encouraged to arrange their points in order and to make brief topical outlines in writing.

The oral lesson may be presented in different ways. In recitations in the content subjects, such as community civics, history, or elementary science, the work may go forward by questions and answers, explanations, reports, discussions, or summaries. In special lessons in oral English the work may be carried on by means of conversation, discussion, storytelling, descriptions, dramatization, reports, explanations, debates, or extemporaneous speaking.

In connection with practice in oral composition, instruction in good usage should be given. The more technical phases of grammar and composition should be handled by English instructors, and the teachers of other subjects may limit their work to insistence on reasonably good usage. The best practice in teaching would avoid undue stress on many details at one time. A few important principles in grammar or composition may be added from month to month and from term to term. Principles once taught should be observed in all succeeding oral expression. Here a little, there a little, may be taught; but every little should contribute to permanent improvement in speech.

Subject matter of written composition. The subject matter of written composition in the middle grades should be based primarily on the subject matter of oral composition. This being the case, whatever of worth vitally interests pupils in these grades may properly become the content of written composition. Stories, jokes, adventures, games, plays, outings, parties, school entertainments, club work, and athletic events furnish rich sources of composition materials. Current events, readers, and storybooks also may provide subject matter for written expression. Trips to art galleries, zoölogical or botanical gardens, local monuments or fine buildings, furnish the content for written exercises. The conduct of school enterprises, such as the school paper, the savings bank, entertainments given to the public, and athletic organizations, requires the preparation of notices for newspapers, advertisements, records, reports, and letters; and the content of other school subjects furnishes a constant supply of materials for all types of written composition. From the beginning originality of production should be encouraged. Many children from nine to fifteen years of age take the keenest delight in writing imaginative stories of travels, in recounting real or imaginary achievements, or in constructing plays for dramatization.

Methods in written composition. The work in written composition may be motivated by arousing a desire in pupils to preserve materials for personal use, to write for the mental exhilaration or pleasure derived from production, or to communicate with others. If the mechanics of written composition are stressed too much, they hinder the flow of thought. For this reason it is best at first to develop the thought through oral discussion before attempting to commit it to written form.

In the primary grades the pupils learn to write by copying sentences. In this work the simplest elements of capitalization and punctuation may be taught. Dictation exercises give opportunity for the use of both spelling and handwriting. Soon the child is asked to read a short paragraph and then to state the meaning in his own words in written form. By the time a pupil reaches the fourth grade he is already acquainted with some of the simple elements of written composition. The object in succeeding grades is to enlarge his ideas and to teach him the additional mechanics necessary to commit these ideas to writing.

Instruction in written composition in the middle grades will proceed, on the more formal side, by the use of models to be copied, sentences or paragraphs to be completed, dictation exercises, sentences, and paragraphs to be corrected or paraphrased, and selections to be condensed, outlined, or reproduced; on the more productive side, pictures may be described, stories may be told, or letters may be written. The proper mingling of formal instruction with stimulation to original production is the highest mark of efficiency in teaching written composition.

The most successful methods for teaching composition, both oral and written, include practice in simple narration, or story-telling; description; explanation, or exposition; and reasoning, or argumentation. In the middle grades these types of composition appear as simple stories, dialogues, class notes, poems, or in letters of different kinds. Letter-writing may be adapted to all types of composition; for that reason it offers an excellent means for teaching correct speech.

While motivation and materials constitute the first considerations in teaching written composition, certain devices must be used for making criticisms or corrections. When compositions are placed on the blackboard or read before the class, the combined knowledge of the entire group may be concentrated on any point. In this way the work may be socialized. But each pupil must be led to become his own critic. For the attainment of this end the teacher may use a system of marks or checks that will indicate different kinds of errors in the pupil's work. In the lower grades, as previously suggested, only the grosser errors should be stressed; but pupils should be held rigidly responsible for the continued use of the principles selected for attention from time to time.

Results of scientific investigation in spelling. In 1897 Dr. J. M. Rice[1] published the results obtained from testing thirty-three thousand children in spelling. The children were in cities located in different parts of the United States. Different types of population, progressive and nonprogressive school systems, schools employing different methods of teaching (some giving long and some short periods to spelling), were included. The results seemed to show that neither home environment, the time given to spelling, nor the methods used in teaching determined success in spelling. The figures did show that, with the exception of the sixth grade, efficiency in spelling increased with the age of pupils. The startling conclusions announced by Dr. Rice led to studies that have completely revised the materials and methods used in teaching spelling.

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[1] "The Futility of the Spelling Grind," *Forum*, Vol. XXIII (1897), pp. 163–172.

The selection of word lists. As a minimum requirement every individual should be able to spell his own written vocabulary. Investigations have disclosed the fact that certain words are used by practically all literate people. These words have been listed and graded and may be made the bases of spelling lessons for different classes of pupils. The Ayres list, the Thorndike list, the Horn-Ashbaugh, and other lists, have been made available for use in the schools.

It is generally agreed that some basic list of words should be used in each of the middle grades. In addition to the basic list, a supplementary class list should be selected from the various subjects studied. Other phases of languages, mathematics, the sciences, industrial subjects, and æsthetics demand the use of written vocabularies. Words from these subjects should be added to the basic lists. Beyond the basic and supplementary lists, each pupil should be urged to construct his own personal list. This personal list should be composed of words misspelled in his written compositions or of new words which he may desire to add to his vocabulary. Leading authorities hold that pupils in the middle grades should learn to spell from five hundred to seven hundred additional words each year.

Methods in spelling. It is a dictum of psychology that we know those things best that we learn through the most avenues. This principle applied to spelling would employ the ear for gaining the sounds of letters, syllables, and their combinations, the organs of voice for uttering the sounds obtained, the eye for obtaining forms, and the hand and arm for giving expression to the forms acquired. Experiments have proved that when all these means are employed, the spelling of words is made more accurate and secure than when only some of them are used.

Another psychological principle asserts that words will be spelled more easily when they are given meaning. This leads to the practice of spelling words in their context; that is, words to be spelled are incorporated in sentences.

In teaching or learning spelling, three phases should be observed. First, the word should be analyzed or divided into its parts. The difficult parts should be noted and made the object of special attention. This applies to words seen or heard. The second phase is that of drill. Drill may consist in the visualization, in the vocal repetition, or in the writing of words. The third step is that of testing results. This step may be completed by having the words spelled orally or by having them written alone or in composition.

Testing is a part of the learning process, whether it follows immediately upon analysis and drill or is postponed to some future time. The testing not only discloses the correctness or incorrectness of the word image, but tends to stamp it in. This fact emphasizes the need for obtaining a correct impression in the beginning. In accordance with the laws of habit formation, short, concentrated drills in spelling, with reviews from day to day, are more profitable than the use of longer periods. From ten to twenty minutes a day spent on spelling in the middle grades will probably secure the best results.

Instruction in handwriting. Handwriting plays the same part in written expression that reading performs in oral communication. Writing is a tool that must be mastered by all who hope to succeed with the study of written composition.

By the time the pupil reaches the fourth grade he has already learned something of form, movement, and speed, but much of his writing has been done with crayon or pencil. In studying form, large-sized letters have been used, and neither speed nor movement has reached an advanced degree of efficiency. In the fourth and succeeding grades a higher command of form, as reflected in style, evenness, and beauty, must be attained, and the size of letters must be reduced. These factors are comprised in what is known as legibility.

In learning to write, a correct position of feet, body, hands, and arms must be secured in order to develop that free and easy movement which is essential to facility in composition. In addition to form and an easy arm movement, a satisfactory rate of speed must be secured. Such a command of all the elements of writing should be developed that the composer may give his unobstructed attention to thought production; otherwise his work will be impeded by poor control of the mechanics of handwriting.

A good quality of writing materials should be provided. The materials will include blackboard, paper both plain and ruled, crayon, pencils, pens, penwipers, ink, blotters, pencil and ink erasers, with containers for taking care of writing equipment. The blackboard should be smooth, dead black, and adjusted to the height of pupils. Dustless crayon should be used. Well-sharpened medium-soft pencils give the best results. Medium-sized pens with wooden penholders tipped with cork are recommended. A good quality of ruled paper will be needed for establishing the proper height and alignment of letters.

The use of one of the established writing scales will be valuable in motivating the work. Pupils should have easy access to the scales and should be encouraged to use them frequently. Teachers who can demonstrate the elements of good writing will be most successful in teaching. The blackboard should be used for setting copies, for pointing out errors, or for illustrating forms.

Specialists on handwriting say that fifteen minutes of earnest practice each day will enable pupils to reach a satisfactory standard of writing for practical purposes. Some writers believe that much time spent by pupils on handwriting is wasted. They would prefer that pupils in the upper middle grades, after a certain degree of efficiency in writing is attained, should spend the writing period in learning to use the typewriter.

Grammar materials. For years vigorous assaults have been made on the practice of requiring too much technical grammar in the middle grades. These attacks led to studies, by Charters and others, of the actual mistakes made by pupils in the use of language. More recently textbooks and outlines of study distribute the subject matter in grammar throughout the different school years. In the first three grades the use of simple verb forms, such as *is* and *are*, *was* and *were*, and contractions, such as *isn't* and *aren't*, are stressed. In the fourth, fifth, and sixth grades more difficult verbs, such as *lie* and *lay*, *sit* and *set*, the proper use of such pronouns as *who* and *whom*, *which* and *that*, the plural and possessive forms of nouns and pronouns, and the simple forms and uses of adjectives and adverbs are presented. In the seventh, eighth, and ninth grades parts of sentences, parts of speech, and sentences treated according to both use and form may be given attention.

Methods for teaching grammar. Until recent times the method used in teaching grammar was largely that of the deductive approach. Today the reverse of this order, or the inductive procedure, is applied. Use is placed before the science of language, illustrations are given before rules, much of the formal parsing of words is omitted, and the detailed analysis of sentences is postponed until pupils become more mature. Grammar is so mingled with oral and written composition that much which was formerly taught in an abstract way is now learned with interest and without notice of the fact that grammar is an important part of the work. In short, grammar in the middle grades must be made subsidiary to oral and written composition. When pupils become interested in using correct oral speech or in writing a well-composed letter to an acquaintance, the most favorable opportunity for teaching grammar has been provided.

In teaching the principles of grammar, lists of common errors should be made. Drills and reviews on difficult points will be necessary. Gross errors in oral and written work should be checked. "Better speech week" may be used as a sort of "revival service," but teachers should see to it that pupils do not backslide when the week ends. Typewriting, typesetting, or proofreading for the school paper may be used with some pupils to motivate a study of grammatical forms. A rough diagram will often assist in teaching sentence structure. An exchange of themes for reading or correction may stimulate interest in proper usage. Since the proper use of language is so largely a matter of imitation, a study of grammatical usage as found in model selections will be of great assistance.

Subject matter and methods in literature. While interesting subject matter is the best foundation upon which to base a study of the mechanics of language, it should not be used for this purpose alone. Some types of literature furnish knowledge or information; other types give pleasure or inspiration. Literature contains the ideals of the nation. It should be read both for enjoyment and for stimulation. An abundance of reading material should be provided for the middle grades. Whether it be for pleasure and entertainment or for establishing the reading habit, encouragement and guidance in the selection of literature for the pupils at this stage of development are matters of supreme importance. Suitable reading lists for the different grades may be secured from various standard programs of study, or from the American Library Association.

More important than all methods of teaching reading for appreciation is a teacher who is acquainted with, and who loves, the masterpieces in children's literature. The teacher's first step should be to bring to the attention of pupils selections with probable appeal. Reading for appreciation or for pure enjoyment is largely a personal matter; hence library reading or home reading may bring best results. The boy who secretes the detective story in his desk that he may take a peep at it during odd moments, and the girl who steals away to the attic to devour a gripping love tale, bear witness to the companionship that even young children may find in books. If the methods used in teaching literature are successful, the amount of reading done out of school will greatly exceed the amount done in school.

VII. UNITS OF WORK IN ENGLISH

Lesson in Oral Reading: Fifth Grade

Purpose. To provide an opportunity for pupils to examine, appreciate, and render orally a choice lyric poem.

Selection. "Little Giffen," by Dr. Francis Orray Ticknor.

Procedure. 1. The teacher should introduce the poem by a brief statement concerning the setting — the place, the time, the author's profession, etc. Pupils may then be requested to read the selection silently for first impressions.

2. Next, the teacher or some good reader may read the entire poem. After the reading the pupils should be allowed to ask questions about any parts not understood. Such expressions as "Smitten of grapeshot and gangrene" (line 3), "knights of the Golden Ring" (line 33), and "The whitest soul of my chivalry" (line 37) may need interpretation. The teacher may call for explanation of parts not mentioned by the pupils.

3. After the explanations of obscure parts the pupils should be permitted, in turn, to select and read the stanzas that they like best. Reasons may be given for the selections: they express courage, loyalty, patriotism, etc.

4. The pupils may desire to know more of the author or of the background of the poem. If so, the probable history of the hero before and after the incidents described in the poem, as related by Mrs. Ticknor, may be cited.

5. If, near the close of the period, pupils should wish to recite parts or entire stanzas, they should be permitted to do so. Finally, the class may be encouraged to commit the entire poem to memory with the understanding that one or more pupils will be allowed to recite it at the next meeting of the class and, possibly, on the occasion of some future entertainment.

Lessons in Appreciation, Interpretation, Composition, and Dramatization: Seventh Grade

Purposes. To lead pupils to read, enjoy, and interpret a legend which portrays certain types of individuals, describes features of an interesting locality, and suggests rapid changes that were taking place in America about the time of the Revolution, and to assist them in adapting and dramatizing such parts as they may select.

Selection. *Rip Van Winkle*, by Washington Irving.

Motivation. As a means of arousing interest the dramatization by Joseph Jefferson may be discussed. Such questions as the following may be raised: Why did Jefferson select this play? What are the elements in it that suited his purpose? Why did the people continue to call for it after Jefferson had grown tired of it? Since the work will occupy several class periods, the pupils should be given plenty of time for reading the selection.

Further procedure. 1. After reading the selection the pupils should be allowed to give their general impressions of the story. Comments may be made upon the characters: Rip, the dwarfs, Dame Van Winkle, Rip's neighbors, and possibly Rip's dog. Pupils may speak of the mountains, of the forests, or of the sunset. Some may want to know why Hendrick Hudson, George Washington, and Stony Point are brought into the legend.

2. Should the class decide that they would like to select parts of the story for dramatization, this will provide motivation for a more detailed study of the selection. After some preliminary examination of the setting, characters, and movement has been made in class, the pupils may be divided into groups for the purpose of selecting the parts to be dramatized. These groups should report to the entire class from time to time.

3. The proposed dramatization will give good motivation for the composition work. After a general outline has been agreed upon, the class may again be divided into groups, and each group may become responsible for a part of the play. Written reports may be made to the class, and the work done may be discussed and approved, or suggestions for changes may be made. Toward the end a committee may be selected to give final form to the play.

4. Parts of the play should now be chosen, and the work on dramatization may begin. Excellent opportunity will be

afforded here for training in speaking, gesture, and movement. Costuming will stimulate both interest and effort. Finally, if the production should prove worthy, it may be presented before the entire school.

Lessons in Newspaper-Reading: Any Middle Grade

Aims. 1. To assist pupils in learning to classify news and to locate readily special features desired.

2. To stimulate the power of discrimination and to encourage the cultivation of taste for news that is worth while as opposed to the sensational and gruesome.

3. To assist pupils in learning to analyze news articles and to give orally a clear and correct statement of the matter read.

4. To encourage pupils to become efficient, habitual newspaper readers.

This subject may be taken up in any one of the middle grades. The number of lessons required in any grade will depend upon the previous training of the pupils in newspaper-reading.

Subject materials. Copies of reputable daily or weekly newspapers.

Teaching procedure. 1. Each pupil should be provided with a copy of the paper to be used.

2. Pupils may be permitted to look over the paper, page by page, and to locate the various headings under which the news is classified. The society column, the sports page, the editorial page, etc. may be pointed out. A correct list of the divisions of the paper may be written on the blackboard as parts are named. Copies of other papers may be distributed, and pupils may be drilled in locating the different classes of news outlined on the board.

3. When the time for the reading lesson comes, it will be best at first for all the pupils to read the same article. A

thorough analysis of the contents should be made. By reading the same selection the work may be socialized.

4. After sufficient work has been done in class the reading may be shifted to the reading room or the home. The newspaper-reading in the home may be checked through the oral composition lessons in school. The kinds and values of the items selected and the thoroughness, accuracy, and clearness of the reports will indicate the progress made.

Lessons in Oral and Written Composition: Fifth Grade

Proposal. To assist pupils in the improvement of their oral and written composition by means of fable-writing.

Procedure. 1. Pupils may be permitted to suggest fables that they have read and enjoyed. This will create interest and give opportunity for oral composition. The suggestion that the class might like to write a fable may be made.

2. As a matter of preparation one of the fables named by the pupils may be taken as a model; for example, "How Clytie was changed to a Sunflower." If sufficient books containing the fable are not available, the selection may be written on the board.

After the story has been read and commented upon in general, the pupils may be allowed to select and discuss different parts. Among others, observations may be made with regard to (1) Apollo's duties, (2) Clytie's love for Apollo, (3) Apollo's daily trip, (4) Clytie's faithfulness, (5) the reward, and so on. The suggestions made may be sketched in outline as just indicated.

3. All traces of the story may then be erased, and pupils may be allowed to write their fables. Although the first products will probably be largely reproductions, an excellent opportunity will be afforded for practice in composition work.

4. At the next class period the compositions of the pupils may be read, discussed, and rated by the class. The proposal to write a new fable will now be in order. Members of the class may desire to make suggestions as to outline, characters, etc. A brief outline may be agreed upon, and each pupil may then be permitted to develop it as he sees fit. The work may be carried forward from day to day, developing more and more originality until satisfactory results are obtained.

The single paragraph should be the unit of composition used in these lessons.

Lessons in Composition: Sixth Grade

Ultimate aim. To develop in pupils the ability to relate an experience with interest and precision.

Immediate aim. To use a real or imaginary adventure as an instrument for teaching the principles of narration and description in oral and written composition.

Topic. Adventures at a school picnic.

Procedure. 1. The meaning of an adventure may be discussed, and pupils may be encouraged to relate some of their own adventures.

2. The adventures at a real or an imaginary school picnic may be outlined by pupils. The outline may contain such items as (1) teacher tardy because of illness; (2) start further delayed because of rain; (3) necessary to cross swollen stream; (4) car in ditch because of slippery roads; (5) forced to leave part of lunch and change picnic grounds; (6) later the sun comes out; (7) car arrives with lunch; (8) games; (9) meal enjoyed; (10) the trip home.

The development of the outline will give opportunity for drill in oral composition. A few points in language should be selected and stressed. Such matters as beginning sentences with "and" or "well," the selection of suitable words, and the avoidance of slang may receive attention.

3. Pupils may now be allowed to write paragraphs on parts of the outline. Divisions of the outline should be distributed, so that no one will be required to write on more than one feature. When the class meets, pupils may read their paragraphs. These may be discussed with reference to interest, construction, clearness, and the like. Groups may then be formed to select the paragraphs which when taken together will make the best story. A committee may be appointed to weave together the parts for the next class meeting. For further work individual pupils should write about other real or imaginary adventures.

Lessons in Composition: Eighth Grade

Ultimate purpose. To lead pupils to be clear and orderly in making explanations.

Immediate purpose. To teach a class how to organize and present in an accurate and proper form the knowledge required to play a national game.

Problem. To explain how to play baseball.

This problem will furnish enough materials for several exercises. The game of baseball is complex; one feature should be taken at a time.

Most eighth-grade pupils, especially boys, will already know the more general rules of the game. This will insure a background that may be made valuable in the teaching procedure.

Procedure. 1. The problem may be approached by inviting pupils to mention important factors of the game. Among others the following may be suggested: (1) dimensions of the diamond; (2) positions of the players; (3) duties of the umpire; (4) different ways in which the batter may reach first base; (5) ways in which the batter may be put out;

(6) rules for base runners; (7) rules for catchers and pitchers; (8) definitions of such terms as "ball," "fly," "foul," "inning," "score," etc.

2. The class may be divided into groups for the study of different parts of the game. In making the oral reports each pupil should be allowed to explain one point. After the oral work has been done, the pupils may write up the explanations.

3. Diagrams may be placed on the board by the pupils. Parts of the game may be dramatized in pantomime by placing players in different corners of the room. Imaginary plays may be made, with decisions by the umpire followed by explanations of the decisions.

Written explanations prepared by the pupils may be placed on the board for criticism as to fact and form. In these, as in all lessons in oral or written composition, gross errors should be mended and important principles should be stressed.

4. As a means of motivation it may be agreed in the beginning that when sufficient progress has been made in the study of the plays a game of baseball shall be played by the class.

Lessons in Composition: Ninth Grade

Ultimate aim. To teach pupils to analyze a proposition and be able to present in good form the arguments that support or oppose it.

Immediate aim. To study the proper procedure in argumentation and to improve the speech of children through participation in oral and written debates.

Selection of subject. Pupils may be allowed to suggest subjects in which they are interested, with reasons for the selection of this one or that. From this list the following proposition, for example, may be selected: *Resolved*, That a short school day is better for pupils in the middle grades than a long one.

Class preparation. After the subject has been chosen, pupils should be allowed to raise points in an informal discussion. Among others the following may be suggested: Can pupils study better at home or at school? Where are there more interruptions? more books and references? Can one get more help from parents or teachers? Would it be better to have more play-time at school or at home? Would a longer school day, with more preparation at school, be better or worse for those who desire to sell papers, run errands, or assist with home duties? Which would be better for teachers? Which would be more economical for the school board? The points raised by pupils may be supplemented by the teacher.

Pupils will usually take more interest if they are allowed to choose sides for the debate.

Conduct of debates. With the guidance of the teacher the pupils may select chairman, secretary, timekeepers, and judges from their own number. At first the teacher may be selected as critic. Elimination debates may be held, but the pupils eliminated should not be excused from further work; they should be permitted to assist in gathering arguments for the remaining contestants on their own side.

The interest that may be engendered in a study of English through class, interclass, and interschool debates is well known to those who live in states that foster interscholastic debate leagues.

However, the main purpose of debates in the upper middle grades should not be overlooked, and that is to improve the oral and written speech of pupils by means of proper study, instruction, and practice in speech forms.

Lesson in Spelling: Fourth Grade

Ultimate purpose. To teach pupils to spell their own written vocabularies.

Immediate purpose. To teach the spelling and use of five words taken from a fourth-grade word list.

Words selected: *often*, *believe*, *impossible*, *Wednesday*, and *celebration*.

Teaching procedure. 1. The teacher should write the words on the board slowly, concentrating the attention of the pupils on each letter and syllable as far as possible.

2. The words should be pronounced distinctly, at first by the teacher and then by the pupils.

3. Instruction on the spelling of the different words should be given. Attention may be called to the silent letters in *often*; to the *i* before the *e* in *believe*; to the spelling of each syllable in *impossible*; to the capital *W*, the silent *d*, and added *e* in *Wednesday*; and to the spelling of the first, second, and last syllables of *celebration*. Explanations as to how words are made up from other words will often help with spelling; for example, Wednesday was once called Woden's day. Rules of spelling, such as beginning the days of the week and the months with capitals will prove helpful.

4. The drill may be carried on by spelling the words thoughtfully and silently with face turned from the board, by writing them on paper, or by visualizing them with eyes closed.

5. The words should now be erased from the board, papers on which written drill has taken place should be put away, and the test should be given by requiring the words to be spelled orally, written separately, or used in original sentences.

6. Finally, the words may be added to the list previously learned, and be reviewed from time to time.

The procedure outlined includes instruction, drill, and testing, steps that may be used in teaching word lists in all grades.

While many words are common to all written subject matter, some are peculiar to certain subjects. Special lists of words selected from different subjects should be added to the standard lists and made a part of the pupil's spelling vocabulary.

Lessons in Handwriting: Any Lower Middle Grade

Purpose. To lead pupils to improve in certain selected phases of handwriting to the end that they may come to write legibly, rapidly, and with bodily ease.

Time of day. Preceding but not immediately following a recreation period.

Length of period. Ten to fifteen minutes daily in the fourth, fifth, and sixth grades.

Procedure. 1. Desks should be cleared and all needed writing materials made ready. Teachers of writing generally agree that the best means for motivating lessons in handwriting is a constant use of standard handwriting scales. These should be provided and made easily accessible to all members of the class.

2. Correct models should be placed on the blackboard, and small models should be provided for pupils at their desks.

3. Correct positions of body, feet, arms, hands, and fingers should be demonstrated by the teacher.

4. The lesson for the day should be selected and explained. Form must be impressed upon the mind before it can be expressed through the hand. Clear instruction is as essential in teaching handwriting as in teaching spelling.

5. Lessons should usually begin with practice on position and movement. Counting will aid pupils in developing proper speed and control.

6. After this preliminary drill the pupils may be allowed to take up individual work. The teacher should pass among them, giving instruction wherever needed. Should a number of pupils require help on some common point he may step to the board and illustrate for the entire group.

7. Pupils should become accustomed to frequent use of the standard scales.

8. Finally, pupils should not be required to give attention to their writing during the lesson on that subject and then be permitted to disregard it in the preparation of other written lessons.

VIII. CHAPTER SUMMARY

The growth of civilizations demands the development of languages. The Greeks and Romans developed highly inflectional languages for the embodiment of their civilizations. When their civilizations perished, their languages were no longer living tongues.

With the coming of the Renaissance the dead languages became the principal studies of the schools. Since there were few teachers who could speak Latin and Greek, the use of indirect, or translation, methods became necessary. Later, when the vernacular came to be an important school subject, the methods used in studying the dead languages were transferred to the study of the living tongues.

One of the greatest influences leading to the introduction of the vernacular into the schools was the desire to prepare everyone for the reading of the Bible. However, there were certain persons of a practical turn of mind, of whom Benjamin Franklin was a good example, who believed that secular material also should be used, and that the mother tongue should be placed before all others in the schools.

The first textbooks for teaching English were filled almost entirely with religious materials. By and by primers and spelling books began to include more and more secular matter. As time passed, textbooks on spelling, reading, grammar, rhetoric, composition, and literature appeared, but these continued to call for verbatim recitation of memorized materials.

In the latter part of the first half of the nineteenth century, while Webster's spelling book and Murray's grammar continued to be popular as textbooks, certain series of readers and composition books proposed more modern types of materials and methods. In the latter half of the century many series of language books appeared. A distinct disposition to use more practical methods and more interesting materials became apparent.

The introduction of modern foreign languages into the schools has steadily reduced the study of the ancient languages. For a time the methods used in the ancient languages were used in teaching the modern foreign languages. More recently the use of the indirect, or translation, method has been yielding to the direct method in teaching modern languages. For those who will need to speak foreign languages there is ample reason for beginning them as early as possible.

It is now proposed that the dead materials formerly used in teaching language shall be eliminated and that living matter shall be substituted. The written vocabularies of children, literature suited to children's interests, the use of much oral composition, and the direct application of language to the needs of everyday life are to be made the bases of materials and methods of instruction.

EXERCISES

1. Make a table showing the amounts of Latin studied by pupils from nine to fifteen years of age in German, French, and American schools.

2. Rank in order of popularity the foreign languages studied in the schools of your own state.

3. Compare the arguments usually presented for the study of Latin with the ones put forward for the study of the modern foreign languages.

4. Explain the differences between the direct method and the indirect method of teaching languages.

5. Trace changes made in readers used in the schools within the last fifty years.

6. Secure a copy of one of the early English grammars and compare its contents with those of one in use today.

7. Give a list of reasons why early methods used in teaching grammar failed to make great improvement in the pupil's use of language.

8. Outline the changes made in materials and methods used in teaching spelling within the last twenty-five years.

9. Explain what Professor Smith meant by this statement: "Literature, composition, and grammar go together. To separate them is to deprive literature of its support, composition of its inspiration, and grammar of its goal."

10. Suggest a list of principles that should be observed in the selection of suitable topics for compositions in the middle grades.

11. Compare the relative values of silent and oral reading, and suggest difficulties that may arise in the teaching of each.

12. Make a list of the tool subjects in English.

13. Make a comparison of the Ayres scale and the Thorndike scale for judging handwriting.

14. Write a *page* summary of recent changes in methods of teaching English to children from nine to fifteen years of age.

15. Outline procedures for teaching five lessons in different phases of English, observing the principles presented in the preceding pages.

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CHAPTER VIII

THE DEVELOPMENT OF SOCIAL RELATIONSHIPS

I. MATERIALS AND METHODS IN THE SOCIAL SUBJECTS

Origins of social subjects. With the development of the home, the church, and the state, man came to recognize an ever-increasing body of social attitudes, customs, and laws. To perpetuate and enlarge social institutions it was necessary to instruct each younger generation in the ideals, ceremonies, and observances of the groups.

Early civilizations instructed the young not only in the theory of social institutions, but gave them actual practice in the application of social laws. The Greek boy was required to sit in judgment on his own conduct or the conduct of his companions. When his judgments were good he was commended; when they were bad he was punished. He was taken into the fields that he might learn the geography of his country; he was led to the market place that he might observe the customs of his elders. In like manner, the Roman boy was given a rigid training in all that pertained to social life.

By and by the knowledge dealing with social relationships came to be classified under different headings called subjects. Today these subjects are known as anthropology, geography, history, civics, sociology, economics, etc. Elements of these have been taught for centuries, and the phases of them that are suitable for pupils in the middle grades now usually appear as geography, history, or civics.

II. MATERIALS IN GEOGRAPHY

Origins and divisions of geography. Because of man's intimate relationships with the earth and certain heavenly bodies geography became one of his earliest studies. He watched the heavens with awe. Much of his conduct was influenced by the movements of the sun, moon, and stars. At first, astrologers attempted to explain the changes observed; later, astronomers took up the task. Finally, the geographers gathered together certain facts related to the movement of the parts of the solar system and organized them into what is known as mathematical or astronomical geography; knowledge pertaining to the structure and divisions of the earth became the subject matter of natural or physical geography; and institutional life, represented in governments, religions, languages, laws, and customs, provides the subject materials of political geography.

Modern pioneers in the field of geography. Carl Ritter, professor of geography in the University of Berlin from 1819 to 1859, is credited with changing geography from a conglomerate subject to a science. Ritter became greatly impressed with Pestalozzi's methods of teaching. He is said to have visited him at Yverdon in 1807.

Pestalozzi's methods consisted largely in the application of Rousseau's suggestions in *Émile*. Observation of geographical conditions and their representation by means of maps constructed by pupils played a large part in his teaching. Through his books and lectures Ritter passed the ideas of Pestalozzi, coupled with his own, to the thousands of students who attended his classes within the forty years spent as a professor in Berlin. Among those who visited his classes was a Swiss student named Arnold Guyot, who later came to America and greatly assisted in the development of geography in this country. But whereas Guyot's service was rendered through lectures, Colonel F. W. Parker, an American, organized a school and put the theories of Ritter and Guyot into actual practice.

The development of textbooks in geography. In the first half of the nineteenth century geography received scant attention in the elementary schools of this country. The only books available were small outlines published by Dr. Jedidiah Morse about 1786, and Nathaniel Dwight's *System of Geography*. These books were based on the question-and-answer plan of teaching.

About the middle of the last century different series of textbooks began to appear. One of the more prominent of these was that prepared by Augustus Mitchell and published by A. S. Barnes and Company. At first the series consisted of four books, but later it was extended to seven: *First Lessons in Geography*, *Primary Geography*, *Intermediate Geography*, *Geography and Atlas*, *Physical Geography*, *Outline Maps*, and *Ancient Geography*. These books were of the strictly question-and-answer type. Although map-drawing was introduced, it was of the purely mechanical form.

Another popular series of books was the one prepared by Dr. M. F. Maury, who was known as the "Pathfinder of the Seas." The author states that he began the preparation of his series in 1866. The popularity of these books is suggested by the fact that between 1880 (the date of first publication) and 1915 they were copyrighted eight times. In this series excellent pictures appear, showing industries of different countries. Maps with questions and answers hold an important place. Animal and vegetable life receives considerable attention. One book is "designed for Primary and Intermediate classes." It is asserted that the "style is simple and interesting. The text presents the best methods of instruction. The maps are new, and the illustrations are all reproductions of new photographs." This series of books presents the general types of materials and methods used in teaching geography until almost the close of the last century.

While Guyot, in his institute lectures from 1848 to 1854, urged reform in the teaching of geography, and while Parker trained teachers of geography along the new lines at the Cook County Normal School from 1883 to 1896, it remained for Alexis E. Frye, one of Colonel Parker's most renowned disciples, to publish in 1895 a geography embodying many of the principles advocated by Rousseau, Pestalozzi, Ritter, Guyot, and his own illustrious teacher, Colonel Parker. Also, as observed by S. C. Parker, "The Redway and Hinman *Natural Geographies* published in 1898 are a part of the same tradition."[1]

Since the publication of the Frye book in 1895, many series of geographies have appeared, practically all of which employ new types of subject matter as well as better methods of teaching. The old-time map with columns of questions has given way to maps which exhibit elevations, river systems, and other natural features in an impressive manner. Instead of merely naming the natural and manufactured products of different countries, photographs show these in fields and factories. Animal and plant life is well illustrated. Instead of a mass of disconnected facts, interesting descriptive materials are presented in story form. Details are attached to problems so as to make them meaningful. Home geography is used to explain remote regions. Field trips are urged as necessary phases of present-day instruction. Teaching devices, such as maps, charts, globes, magazines, travels, motion pictures, natural products, and various forms of laboratory equipment, are now proposed in the different textbooks. Furthermore, expression is now brought into play. The new geographies advocate the construction of relief or outline maps, showing the locations of animals, plants, minerals, different kinds of manufactured products, the homes of various peoples, and the courses of mountain ranges, streams, winds, and ocean currents.

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[1] *A Textbook in the History of Modern Elementary Education*, p. 349.

III. OUTLINE OF THE SUBJECT MATTER PROPOSED

Basis assumed for work in the fourth grade. There is considerable difference of opinion with regard to the subject materials in geography that should be assigned to the several school years. There is a somewhat general agreement, however, that in no case should a textbook be introduced below the fourth grade.

Bonser[1] would make food, clothing, shelter, and home products the basis of the work in the first three grades. He would include a study of the natural features of the community, the seasons, climate, gardening, and map-making. From products of the local community he would pass to products of other places. Useful and harmful forms of plant life would receive attention. A surplus or shortage of any commodity would lead to a study of transportation and relationships of one part of the country to another. Immigration would be touched upon through reference to countries from which people in the community formerly came. Excursions to mountains, rivers, and factories are recommended.

For third-grade work the Baltimore County Course[2] recommends, for home geography, a study of seasonal changes, the sun's path, weather records, surface features, occupations and industries of the community; and, for world geography, descriptive and pictorial representations of child life in other lands.

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[1] F. G. Bonser, *The Elementary School Curriculum*, pp. 219–222.

[2] *Course of Study of the Baltimore County Schools*, pp. 159–169.

The minimum course of study in geography recommended for the California schools [1] does not suggest work for the first three grades, but gives as subject matter for the fourth grade "How children work and play in other lands" and "How people live and work in North America."

It would seem that the authorities agree that as a fair basis for the work in the fourth grade, pupils should possess a certain amount of knowledge about home geography. They should also have developed an interest in the home conditions of certain peoples in other lands. The local geography may be learned by means of observations, excursions, and discussions. Interest in other peoples may be developed through the use of pictures and stories read or told.

Subject matter for the fourth, fifth, and sixth grades.[2] With a good understanding of home geography established in the first three grades, the concepts may now be extended in the fourth grade to include the county and the state. Rivers, mountains, highways, railroads, products, and industries may be studied. The influences of soil, seasons, rainfall, and temperature on products and occupations should be examined. The interrelations of people living in towns and in the country and of those living in different parts of the state should be included in the course. In the latter part of the year elements of world geography, such as the form and divisions of the earth, should be taught. The approach to world geography may be made through peoples, products, or natural features.

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[1] Ernest C. Moore (Ed.), *Minimum Course of Study*, pp. 202–204.

[2] This outline of work is suggested for schools that compress the basic work in geography into three years. Many leading geography teachers advocate a four-year cycle of study. It should be noted that the author outlines further work in geography for the junior-high-school grades. Again, there is difference of opinion with regard to the advantages of beginning the study of geography with home geography. Some educators now advocate starting with studies of home life in foreign lands.

The previous study of home, county, and state geography will lead naturally to a desire to know how people in other lands live.

In the fifth grade a more detailed study of the geography of the United States should be undertaken. In so far as natural features affect the lives of people in occupations, home life, manufacture and exchange of products, forms of transportation, and mineral resources, they should be analyzed. The effects of mountain ranges, coastal plains, river systems, deserts, and interior basins on the population should receive attention; so should the development of cities, railroad centers, great industries, and educational institutions. The relation of latitude, longitude, and altitude to food, clothing, shelter, rainfall, and occupations should be considered. The influence of immigration and of exports and imports on different sections of the country should be studied. Our relations to Canada, Mexico, Central America, South America, and to the countries of eastern Asia and of western Europe, may be taken up because of our mutual interest in peoples, exchange of products, education, and home life.

The sixth year may be given to a more intensive study of the natural features, climatic conditions, occupations, products, populations, and institutions of Europe, Asia, Africa, and important islands, as these are related to each other and to the people of the United States. By the time a pupil completes the sixth grade he should have a fair idea of the relation the natural features, products, peoples, occupations, and institutions of the leading countries of the world bear to those of his own country. He should know something of the oceans as pathways of travel and of commerce, of ocean currents and winds as they affect climatic conditions, and of the earth's general relationship to the sun and other parts of the solar system.

Geography in the junior-high-school grades. Differences of opinion will arise as to the selection of topics and the order of sequence that should be observed in teaching geography in the seventh, eighth, and ninth grades. One thing is certain: while one lives he never gets beyond the influence of geographic conditions. Furthermore, whether he wills to do so or not, he must observe and continue to study geography throughout his entire life. Geography has already become useful to other subjects in the lower grades, and may be made extremely helpful in the junior high school. The introductory courses in the sciences, languages, and industrial subjects, as well as the continuation of the allied social subjects of history and civics, and the guidance courses in occupations and industries, call for the best types of geography teaching.

However, the author believes that formal problems and projects in geography should be continued through the seventh grade. Problems may be given which deal with erosion, mountain ranges, watersheds, rivers, mineral deposits, alluvial soils, and the influence of these on the development of different countries. Comparison of the populations, areas, products, and wealth of various countries with those of the United States may be made. A review of important topics covered in the lower grades, with enlargement of content and application, may be made a part of the course. A more intensive study of problems of immigration in their relation to other countries and to the United States may be included. Conditions of labor, home life, forms of recreation and entertainment in different countries, may be compared. A more intensive study of imports and exports, our commercial relations with our neighbors Canada, Mexico, and South America, may be made of value. After the basic work in geography has been covered the topics selected will depend upon locality, the stage of the pupil's advancement, and the immediate purposes of the teacher. California's neighbors are Asiatics; New York's are western Europeans. Pupils in the seventh grade will not be as well prepared to make comparisons of the wealth of different nations as will those in the ninth grade. Teachers will differ in training and in interests. These matters, along with other factors, should influence the selection of subject matter in geography for junior-high-school pupils.

IV. METHODS IN GEOGRAPHY

Rousseau's ideas. Because of the influence that Rousseau's ideas have had upon the teaching of geography the following quotation[1] is given:

> His [Émile's] first two points of departure in geography will be the town where he lives and his father's country place; then the places in between; then the rivers of the neighborhood; finally the observation of the sun and how to find his bearings. This is the junction point. Let him make himself a map of all this,—a very simple map at first, made of two objects only, to which little by little he will add others as he comes to know, or to estimate, their distance and their position. . . . It is not necessary that he know exactly the topography of the country, but he should be able to acquire a knowledge of it. It is of slight importance for him to carry maps in his head, provided only he understands thoroughly what they represent and has a clear idea of the art by which they are made.

In this quotation note the factors of method proposed by leading geographers today: (1) home geography as the starting point, (2) the enlargement of concepts to include more remote regions as the child becomes more experienced, (3) the construction and use of maps by pupils, and (4) the omission of details that may be readily learned when needed if the child is taught how to locate knowledge for himself.

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[1] J. J. Rousseau, *Émile*, Vol. II, p. 13. Edition of 1762.

Rousseau's ideas applied by Pestalozzi. It was Pestalozzi, however, who first applied the theory of teaching home geography proposed by Rousseau. De Guimps[1] says:

> Pestalozzi's method of teaching geography has completely revolutionized the teaching of that science. The child is first taught to observe the country about his home, not on the map but on the land itself; it is the child himself who draws the map, correcting the mistakes in his first attempt after another visit to the spot. Having thus learned to understand and to read maps, he continues his study by the help of large maps hung on the wall.
>
> From the very first day, geography is connected with other sciences, such as natural history, agriculture, local geology, etc., which make it very attractive even for children.

It may be observed that Pestalozzi not only taught geography by means of excursions and the use of both pupil-made and wall maps, but also proposed to teach this subject in connection with other related subjects. After more than a hundred years present-day teachers of the social subjects are proposing to put his methods into practice by combining geography, history, and civics in the solution of social problems.

Colonel Parker's influence upon methods in geography. Three points of view have been advocated with regard to the relationships of the different phases of subject matter. The first theory would make the different subjects coördinate and unrelated, the second would set up certain subjects with equal rank but would correlate them with each other, and the third would select a single field of knowledge and concentrate the others around the one selected. These theories are known as coördination, correlation, and concentration. Followers of Herbart have supported the theory of correlation; Colonel Parker went still farther and advocated concentration around the sciences, especially geography. For some years this theory was put into practice in the lower grades of the Chicago Normal School and to some extent elsewhere. But while the theory of concentration has not made much headway in the schools, Colonel Parker must be credited with carrying forward a great enthusiasm for geography and the methods proposed by Rousseau, Pestalozzi, Ritter, and Guyot, which have come to dominate the teaching of this subject today.

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[1] Roger de Guimps, *Pestalozzi: His Life and Works*, p. 414. Reprinted by permission of D. Appleton and Company, Publishers.

The present-day conflict over methods in the social subjects. A comparison of the textbooks in the social subjects of the last century with those offered more recently reveals a clear tendency to adapt subject materials to the psychological and sociological theories of modern times. But even beyond the improved selection and organization of the materials in geography, history, and civics, there is an insistent demand for a better correlation of these subjects. The claim is made that through a proper use of problems and projects, as already suggested, the different phases of the social sciences may be so blended that geography will provide a setting for history, and that history will contribute to the solution of problems in social life.

At present certain rather formidable difficulties are suggested by those who believe that it is necessary to carry geography, history, and civics as separate subjects. Among the difficulties mentioned are (1) a lack of suitable textbooks, references, and equipment for conducting the work, and (2) a dearth of teachers prepared to handle this work according to the methods proposed. It is held also that some facts should be learned in the several subjects that cannot readily be used in the solution of immediate problems but will be useful as tools in the solution of problems in later life. It is argued that problem-solving is a slow process, and that it would be impossible to give a sufficient number of problems to involve all the subject matter which pupils should acquire.

Those who stand for the closer correlation or blending of the social subjects say (1) that subject matter will not be retained unless it is made meaningful, (2) that more materials may be mastered when they are organized to meet some definite need, (3) that a system of organizing materials is more important than any number of unrelated details, and (4) that geography, history, and civics are merely different phases of one system of relationships and become inert when they are presented as separate fragments. It is conceded that thus far materials have not been organized in accordance with the correlation theory, and that teachers in general are not prepared at the present time to use the problem method of teaching. To meet these difficulties it is proposed to reorganize the textbooks and to train teachers in a technique for directing study.

Devices for teaching geography. No other subjects taught in the middle grades offer greater opportunity for motivating study than does the subject of geography. The production, transportation, and consumption of the various articles of food, clothing, and shelter are, directly or indirectly, matters of daily concern to all people. An interest in animals, plants, and peoples is common to all normal children. Excursions or travels to places near and far arouse young people to the highest degree of enthusiasm. Even the changes of day and night, of seasons, and of climate are matters of immediate concern.

Many of the basic instincts, as the demand for food, clothing, shelter, bodily movement, manipulation, mechanical construction, a desire for travel, property instincts, and the tendency of the mind to flow from the immediate to the more remote — "from the known to the related unknown" — may be employed in teaching geography.

Because of the possibility of using so many natural interests, devices for teaching geography are rapidly increasing in numbers and in suitability.

At first a poor quality of maps was about the only device found in books; after a time outline maps to be filled in by pupils were provided; today freehand maps, relief maps, wall maps, and globes of various kinds are used.

Whereas formerly small textbooks were supposed to contain all the subject matter needed, now the textbook is used merely as a guide, and supplementary materials furnish the real vitality of the work. Furthermore, literature, history, travels, reports, magazines, and newspapers are now looked upon as necessary parts of subject materials to be used in teaching geography.

New devices in the field of visual instruction are increasing at a rapid rate. This fact is not only revealed in the fine illustrations found in modern textbooks, but is reflected in all forms of educational and commercial enterprises. The kodak and the moving-picture machine enable us to go around the world in a few minutes.

Again, mechanical devices, such as the stereoscope and the tellurion, may be used to good effect. Nor have devices for dramatic work and expression been neglected. For younger children, storekeeping or the construction of product maps will add interest; for older pupils, gardening and participation in industrial work after school will make the materials studied more vivid.

V. UNITS OF WORK IN GEOGRAPHY

Problem 1: Fifth Grade

Proposal. To study the population of the state of Texas with reference to origin, location, and relation to industries.

Sources of materials. Histories, geographies, the latest census reports, product maps, and various publications put out in the interest of railroads, farm welfare, cotton-growing, stock industry, manufacturing establishments, and the like.

Procedure. 1. The problem may be introduced by requesting pupils to find the map of Texas in their geographies. They may then be invited to examine the names of the rivers, towns, counties, etc. and to suggest any explanations that may occur to them for the different names appearing on the maps. Such names as Waco, Cherokee, Waxahachie, Comanche, may be listed as Indian names; El Paso, Del Rio, San Benito, San Antonio, may suggest Spanish settlements; Fredericksburg, New Braunfels, Schulenberg, may be identified as German names; Fort Worth, Fort Stockton, Fort Sam Fordyce, etc. may be grouped together and questions raised as to why they were so named. In like manner the names of the rivers, bays, lakes, mountains, and counties may be examined and classified.

2. An examination of the map may lead to certain groupings of the names; for example, the Indian names may be found to be well scattered over the entire state, the Spanish names may be more plentiful in the southwestern part, the German names may seem to be clustered in the south-central counties, and so on.

3. After a study of the early settlers, the census report may be examined, which will show a heavy negro population largely concentrated in certain areas.

4. By this time pupils may reach the conclusion that the population of the state is composed of certain groups of peoples coming from different parts of the world. A series of lessons may now follow on the sources of the different groups and the conditions of the countries from whence they came. Indians, Spaniards, Germans, negroes, Americans, etc. may be considered. Nor should the adventurers, soldiers, and various groups that have come in more recent times be omitted. Recent immigration into the Rio Grande valley, into the oil regions, and into the "plains country" should receive attention.

5. Product maps of the state may next be used with good effect. If these are not available they may be constructed by the pupils. Indeed, the construction of such maps may be made a means of motivating an important part of the study. The product maps and the population maps may now be combined. Certain parts of the state may appear as the negro or Mexican cotton-growing section, the German farming section, and so on.

This problem may be narrowed or enlarged to meet the needs of pupils on different levels of advancement. It may be limited to a single locality, it may be extended to a state or a nation, or it may be made the basis of comparison of the populations and industries of countries located in different parts of the world.

Problem 2: Sixth Grade

Proposal. To lead pupils to acquire some understanding of the effects of natural features in general and, more especially, to learn what caused New England to become a manufacturing center.

Sources of materials. Histories, geographies, atlases, census reports, trade journals, topographical maps, weather charts, etc.

Procedure. 1. The study may be opened by placing before the pupils tables, charts, or maps showing the chief manufacturing centers in the United States; or an outline map of the states may be constructed or presented, and the pupils may be allowed to locate the principal manufacturing centers, with the kinds and amounts of their products. To the question Are raw materials always manufactured where they are produced? pupils may reply by pointing to the map, which will show that while cotton is produced in the South, large quantities of cotton goods are manufactured in the North; that hides and wool may be grown in the Southwest but may be manufactured in the Northeast; that while gold is found in the West, jewelry is manufactured in New England.

2. If it should be discovered that New England is a manufacturing center for certain articles, the pupils may be challenged to find out how this came about. Such questions as the following may stimulate progress in the search: Where did the early inhabitants come from? What did they expect to do for a living? What natural food supply did they find?

3. It may be suggested that a knowledge of the natural features would assist in solving the problem. Maps showing mountains, rivers, ocean, bays, inlets, etc. may be consulted. A study of climatic conditions may be suggested. The question of soil fertility may be raised. Were the natural features favorable to farming? What would happen to the supply of game and fish as the population increased? If the conditions for farming were not favorable, how might the people live? Possibly the timber, water power, and waterways might be utilized. Thus pupils may be guided to place natural features and resources alongside of human needs and reach a solution of the suggested problem. They may also be led to relish some speculation as to what New England would do if other places should take up the industries in which she is engaged.

The procedure outlined for the solution of this problem may be applied to many others. The exhaustion of natural resources, the development of new industries and the shifting of old ones, the development of economic conflicts between parts of a country or between different countries, offer an interminable list of problems for solution. This problem may easily lead to a study of peoples and industries in other lands. The relation of the same industry in different countries — for example, the iron industry in Germany and England to our own — may be studied with interest and profit by boys and girls in the sixth and seventh grades.

VI. HISTORY IN THE ELEMENTARY SCHOOLS

History in the elementary schools of Germany. At the beginning of the nineteenth century history had little place in the elementary schools of the world.

The reorganization of the Prussian government after the defeats by Napoleon aroused a patriotic enthusiasm for the development of the fatherland. This enthusiasm, supported by the new methods proposed by Pestalozzi and Herbart, led to a profound interest in "home history" and "home geography." As a result, history and geography began to appear in the elementary schools.

Soon, however, fears arose because of the spread of the liberal tendencies, and the government began to oppose the expansion of the elementary curriculum. Finally, according to Parker[1]:

> In 1854 regulations were issued to curtail the [so-called] over-education. . . . Reading and learning the catechism and the Bible were ordered to be the chief subjects, and all others subordinated. Consequently history was barely permitted, and its scope narrowed until mere fragments were taught now and then.

But with the coming of the new nationalism, about 1870, history was again assigned an important place in the elementary curriculum.

History in the elementary schools of the United States. The growth of democratic ideals in the United States not only led to the organization of our public-school system but has been the controlling factor in the broadening of the program of studies.

The formation of the new government and the conflicts of political parties during the opening of the last century were attended by the introduction of American history in the schools. Rugg[1] points out that the rise of Jacksonian democracy was accompanied by the appearance of a new set of history textbooks.

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[1] S. C. Parker, *A Textbook in the History of Modern Elementary Education*, pp. 406–407. Ginn and Company, Publishers.

While United States history was introduced into the elementary schools in the first half of the last century, as shown by courses of study and state laws, Cubberley[2] says, "History as a subject of study in our elementary schools came in largely as a by-product of the Civil War." No one who may canvass the history materials now offered in the elementary schools will doubt that the World War has deepened the conviction that, along with our own, something of the histories of other nations should be studied by children in the middle grades. Indeed, every great political or social movement in the United States within a century has contributed directly or indirectly to the development of the social studies in the elementary schools. Wars, with the extension of boundaries, the organization of new states, the freedom of slaves, the conflicts of capital and labor, the extension of the ballot, have all contributed to the growth in democracy, which in turn has increased the demand for a greater knowledge of social relationships. This demand has driven the social subjects, including history, deeper and deeper into the program of studies, until they are now ranked among the most essential studies of the entire curriculum.

Herbart, Ziller, and the American Herbartians. Educational historians generally agree that Johann Friedrich Herbart, the great philosopher and educator, was largely responsible for the addition of history to the curriculum of the middle schools of Germany. In 1806 he wrote *The Science of Education*; in 1835 he published his *Lectures on Education*. The first of these contained his theories of education; the latter dealt with their application. Herbart believed that history and literature should be made the two moralizing and socializing subjects of the curriculum.

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[1] Earle Rugg, Twenty-second Yearbook of the National Society for the Study of Education (1923), Part II, p. 52.

[2] E. P. Cubberley, *Public Education in the United States*, p. 307. Reprinted by permission of Houghton Mifflin Company, Publishers.

However, Herbart was more interested in the upper grades of the schools. The adaptation of his ideas to the elementary schools was carried on by Tuiskon Ziller, a professor at the University of Leipzig, who wrote books and organized a society for the study of Herbart's theories. His *Basis of the Doctrine of Instruction as a Moral Force* appeared in 1865. Later (in 1874) a pedagogical seminary was established at Jena for the purpose of putting the ideas advanced by Herbart and Ziller into practice. This school finally came under the direction of Professor William Rein, who worked out a complete outline of studies for the first eight years of school work.

Between 1885 and 1890 certain Americans, including Charles De Garmo and Charles and Frank McMurry, studied at Jena and brought to the United States the Herbartian ideas. In 1892 the American Herbart Society was organized and for ten years greatly influenced the development of educational thought in this country.

VII. EARLY MATERIALS IN HISTORY

Early textbooks. At first the so-called histories were mere chronologies. Chronologies, of course, date back to Greek and Roman times; indeed, the phases of history formerly recommended for study in the early schools of this country were designated as Greek or Roman "chronologies" or "antiquities."

According to Noah Webster the materials for teaching United States history in the elementary schools before 1800 were very limited. Parker[1] quotes Webster as saying:

> No history was read, as far as my knowledge extends, for there was no abridged history of the United States. Except the books above mentioned, no book for reading was used before the publication of the third part of my *Institute*, in 1785. In some of the early editions of that book, I introduced short notices of the geography and history of the United States. . . . In 1788 at the request of Dr. Morse, I wrote an account of the transactions in the United States after the Revolution, which account fills nearly twenty pages in the first volume of his octavo edition.

Cubberley[2] states:

> In 1821 the first little booklet on United States history appeared, though some historical materials had been included in earlier readers under the subject of Geography. In 1822 Goodrich's[3] *A History of the United States* was published, and this at once leaped into popular favor. One hundred and fifty thousand copies had been sold by 1832, when Noah Webster's *History of the United States* appeared to contest its popularity. Both these histories long continued popular as school texts, and the introduction of a study of the Constitution of the United States by Webster into his book marked the beginning of the study of civics in our grammar schools.

By 1860, according to Russell,[4] three hundred and sixty different histories had been published. Of these, one hundred and seven were histories of the United States. At this time American history was taught in the upper grades of the elementary schools, and general history, English history, Roman and Greek antiquities, and some state history were taught in the academies.

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[1] *A Textbook in the History of Modern Elementary Education,* p. 85.

[2] *Public Education in the United States,* p. 219.

[3] This was C. S. Goodrich. Samuel Goodrich, familiarly known as "Peter Parley" and a brother of C. S. Goodrich, wrote history stories which were very popular with children.

[4] W. F. Russell, *The Early Teaching of History in the Secondary Schools of New York and Massachusetts.*

After the Civil War a type of histories purporting to breathe a more fervent patriotism was published. Among the more popular of those used in the upper grades of the elementary schools were Barnes's *Brief History of the United States* and Holmes's *New School History of the United States.* In spite of the good intentions of the authors these books were rather dry and formal.

By 1890 a more modern type of history materials began to appear. A good representative of this type was Eggleston's *First Book in American History*, published in 1889. In the preface of this book we read: "Biography is for him (the child) the natural door into history. . . . In the preparation of the present work I have been surprised to find how abundant are the materials for moral instruction by example in the careers of our great men." The author boasts of the number of illustrations and picture maps found in his book, which was intended to be used as a reader in the fourth or fifth grade. Within the next ten years after the appearance of Eggleston's book, many volumes of biographies and history stories came from the press. Among these may be mentioned Charles A. McMurry's *Pioneers of the Rocky Mountains and the West* (1889), Montgomery's *Beginner's American History* (1892), Eggleston's *Stories of Great Americans for Little Americans* (1895), and Catherwood's *Heroes of the Middle West.* Many of these books were prepared for use as readers in the fourth, fifth, and sixth grades. Although the histories used in the upper grades of the elementary schools were somewhat broadened and improved, the materials continued to be rather dry and uninteresting. The details of war rather than the achievements of peace filled many pages of the books.

VIII. METHODS FOR TEACHING HISTORY

Herbartian principles of teaching. Since the time of Herbart the German teacher has observed the value of geography in teaching all other social subjects — something that cannot always be said of teachers in the United States.

Speaking of this subject Herbart says:

> Geography is an associative science, and should be used to establish connections between various branches of knowledge which ought not to remain isolated. . . . In the midst of other studies considered as more important, geography is generally neglected by the pupils, and often by the teachers. This is wrong. . . . Indeed, it must connect the other studies, and hold them fast in this connection. Without it everything totters.[1]

Of the teaching of history he writes: "Not only are all aids by which historical objects may be presented pictorially and rendered sensuous desirable, but we must consider maps of ancient periods as especially necessary, taking care to have them always at hand and to use them."[2]

Not all of Herbart's theories of instruction appeal so strongly to us today as does his combination of geography with history. While accepting with seeming approval the theory of Rousseau and Pestalozzi for beginning with "home geography," he leaves it behind in his proposals for teaching history. Instead of beginning with "home history," he says, "The chief part of historical instruction for early boyhood is, and will be, Greek and Roman history."[3] He would admit some stories from Homeric mythology, but would eliminate "scandalous fables." He also raises objections to a too great use of biographies as preliminary preparation for medieval and modern history, on the ground that these furnish only fragmentary knowledge.

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[1] Johann Friedrich Herbart, *Letters and Lectures on Education*, pp. 244, 252. Translated by Henry M. and Emmie Felkin. Reprinted by permission of Bardeen School Supplies, Publishers.

[2] Ibid. p. 233.

[3] Ibid. p. 234.

Herbart explains the characteristics of a well-planned lecture in history (still extensively used in German schools), advocates a chronological arrangement of subject matter around important dates, and would have "concentrated summaries committed to memory."

While Herbart argued for thorough preparation on the part of the teacher so that he might "have the power to bring in descriptions here, delineations there," he also said: "Let a teacher practice on the stories of Herodotus. He must commit them accurately to memory, in as true and flowing a translation as possible. The effect on children is marvelous."[1]

Herbart's theories, both right and wrong, have not only influenced the German schoolmaster but have greatly affected history teaching in other leading countries of the world.

Early methods of teaching history in the United States. In the early part of the last century history teaching in the United States was very limited in efficient methods. Rugg[2] quotes from Goodrich's *History of the United States* (1824 edition), "The general divisions should be first very thoroughly committed to memory," and, again, "that portion of the work which is in large type embracing the leading subjects of history should be committed to memory by the pupil."

Russell[3] made a study of the different editions of Goodrich's *History of the United States* from 1824 to 1867 and found methods of teaching changing from the memory and question-

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[1] Johann Friedrich Herbart, *Letters and Lectures on Education*, p. 232. Translated by Henry M. and Emmie Felkin. Reprinted by permission of Bardeen School Supplies, Publishers.

[2] Earle Rugg, Twenty-second Yearbook of the National Society for the Study of Education (1923), Part II, p. 57.

[3] W. F. Russell, *The Early Teaching of History in the Secondary Schools of New York and Massachusetts*, pp. 27 and 28.

and-answer methods to the use of maps, topical outlines, review questions, outside readings, and other procedures found in textbooks of the present day. Although modern practices had their beginnings in earlier times, the old-time method of memorizing persisted through the nineteenth century.

Present-day methods. A century of experience in teaching history has greatly modified old methods while new ones have been added. Herbart's idea that history should be made a great moralizing and socializing subject is now accepted throughout the civilized world. His doctrine that understanding and a many-sided interest should be made the basis of teaching has been greatly developed by his followers. Since his day this doctrine has changed both the materials and the methods proposed by the great German philosopher. His demand for a closer union of geography and history has been receiving more and more attention in the United States for the last fifty years. Today maps, globes, diagrams, pictures, all devices that appeal to the senses, are used in teaching history. Instead of the ancient subject matter proposed by Herbart, teachers of history now surround the child with every helpful type of object or written materials. Instead of being assigned different series of disconnected facts to be committed and recited in class without interpretation, the pupil is now given a topic, problem, or project, upon which he may work for days with an ever-increasing interest and enthusiasm. Memory has not been dismissed, but has been enlivened by meaning. By the use of dramatics and the socialized recitation, history has been changed from an individual subject to a social subject. By the addition of local and collateral materials the textbook has been reduced to the position and service of a guide. In short, the various methods employed in teaching history within the last hundred years have been developed and evaluated, and new devices are being almost constantly added to the list.

IX. PRESENT-DAY HISTORY MATERIALS

Nature of the new materials. The subject materials proposed for the middle grades today differ both in content and extent from those used only a few years ago. Instead of dealing with foreign materials unrelated to American institutions, or only remotely bearing upon them, we now propose to make the origin and development of our own local, state, and national institutions the basis of historical study. Instead of offering mere skeletons of history, it is proposed to extend the books to include the concrete illustrations that give life to the skeletons. Not only the discoveries and explorations, but also the courageous deeds, the thrilling adventures, and the personal characteristics of the discoverers and explorers are presented to children. The skeleton of history clothed with flesh and blood is made to breathe a living message. Achievements of peace are now substituted for the details of war. Man's splendid conquest of nature, his organization of social and industrial institutions, his inventions and discoveries contributing to the physical and spiritual welfare of the race, his development of the fine arts, his transformation from a slaveholder to an advocate of a common brotherhood of man, his care for the unfortunate including all worthy representatives of the animal kingdom — in short, the history of man's civilization rather than a chronicle of his brutalities is now proposed for boys and girls in the middle grades.

The distribution of subject matter. The changes in aims, methods, and materials have caused elements of history to become interesting and suitable instruments of instruction for all grades of the school system. In 1909 the Committee of Eight of the American Historical Association recommended the following phases of history for the different grades in the elementary schools: third grade, heroes of other times; fourth grade, American history, early explorations; fifth grade, American history from the Revolution to the Civil War; sixth grade, European background of American history; seventh grade, American history from 1500 to 1789; eighth grade, American history from 1789 to date, with some attention to modern European history.[1] These recommendations have greatly influenced textbook-making and history-teaching in the elementary schools of the United States.

The Baltimore County Course of Study,[2] whose influence has been felt in many states, follows the committee recommendations to a considerable extent, and those who prepared the outline of minimum essentials in history for the cities of southern California in 1922 acknowledge the influence of the report in the following words: "Since the Report of the Committee of Eight, however, there has been a radical change in the making of textbooks, and instead of the recital of military and political events, there is a much closer approach to that real history of American life, developed by the millions of men and women who have lived, worked, and struggled to make our country what it is today." The California committee, however, did not follow the Committee of Eight by beginning with early explorations in the fourth grade, but preferred to make the history of the local community, state, and nation the basis of social, political, industrial, and economic problems to be studied in the remaining grades of the elementary schools. These problems involved some study of the history of foreign countries in earlier times and in more recent times.

A committee of nine appointed by the American Historical Association, known as the Committee on History and Education for Citizenship, suggested in its report, in 1921, that "The Making of the United States" be studied in the third, fourth, fifth, and sixth grades and that "American History in the World Setting" be taken up in the seventh, eighth, and ninth grades.

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[1] *A Study of History in the Elementary Schools.* Report to the American Historical Association by the Committee of Eight.

[2] *Course of Study of the Baltimore County Schools*, pp. 413–576.

At this time different communities and states are engaged in outlining social-science courses, and no single plan will meet with the approval of all. However, the following outline of study is suggested for the middle grades: fourth grade, local and state history; fifth grade, beginnings of history in the United States; sixth grade, beginnings of United States history in other countries; seventh grade, history of the United States; eighth grade, history of institutions in the United States as related to those of other countries; ninth grade, present-day domestic and foreign relationships.

X. UNITS OF WORK IN HISTORY

Problem 1: Fourth Grade

Ultimate aim. To develop in the minds of pupils an understanding and appreciation of the labors and sacrifices required to make the community and state what they are.

Immediate aim. To study the history of a single community and to learn how its development has been influenced by events that affected the entire state.

Problem. To study the early history of San Antonio.

Procedure. 1. The missions will provide a good starting point. Pupils will be glad to tell something of the Alamo: where it is located, how it is built, and something of the relics on exhibition in it now. Questions will arise: Who built it? What was it built for? Who lived in Texas then? Where did the people who built it come from? Maps may be made showing locations of other missions around San Antonio and in other parts of the state.

2. Different types of peoples that lived in San Antonio — the Indians, missionaries, Mexicans, and early American settlers — may be studied.

3. Excellent opportunity for modeling will be found if the pupils should decide to represent the Indian tent, the mission, the army post, early residences, storehouses, etc. The question may be raised as to how the present style of architecture found in San Antonio came to be used.

4. The occupations of the Indians, missionaries, and early settlers may be traced. Tools and utensils may be studied among the relics available in San Antonio.

5. Another approach to the problem would be to begin with the story of the battle of the Alamo. The story may lead to such questions as Who were Santa Anna, Gutierrez, and General Cos? Who were Travis, Bowie, and Crockett, and what were they doing in San Antonio? This line of procedure may be used to open up not only the study of the conflict between the Mexicans and Texans but that of the conflicts between the Spanish and French and between the Indians and the invaders.

The study may be continued for weeks. The history of industries, public buildings, parks, streets, railways, schools, etc. may be made the bases of profitable investigations. Nor should books be made the only sources of information. Pupils should be encouraged to gather the unwritten history of tradition from early settlers and to put it into story form. The history of San Antonio is but one chapter of the history of the interrelated communities of the entire state.

Beginning with his own environment, the pupil may be led to become interested in the events of more remote times and places. Although not every environment will furnish inspiring historical backgrounds, every state has a history that may be made a matter of absorbing interest to its pupil citizens.

Problem 2: Sixth Grade

Aims. 1. To interest children in a concrete study of medieval life and to give them a basis for contrasting life today with life in the Middle Ages.

Problem. To study the conditions of life as they were in England in the twelfth and thirteenth centuries.

References. 1. *European Beginnings of American History*, by Atkinson, chaps. xiii–xiv.

2. *The Dawn of American History in Europe*, by Nida, chaps. xii–xiv.

3. *Our Beginnings in Europe and America*, by Burnham, chap. ix.

Procedure. 1. It will be fortunate if the pupils have already read some of Scott's books, such as *Quentin Durward*, *The Talisman*, *Ivanhoe*, or *The Lay of the Last Minstrel.* If so, a discussion of these may be made a starting point for the study. In the absence of a knowledge of these or other similar writings, pictures of dress, of knights, of houses, and of scenes in the life of medieval times may be used.

2. Dramatization may be used to represent the different classes of people of the time under consideration. Different pupils may be allowed to dress as lords, nobles, church officials, serfs, slaves, outlaws, minstrels, etc. This will require study of the groups to be represented.

3. Pupils may be allowed to construct in sand the castle, the monastery, the manor, and the lands, and to explain their uses.

4. Phases of life in the castle may also be studied and dramatized. Duties of the lords, knights, women, and workmen may be explained. Forms of amusement will prove interesting. These may be compared with the forms of entertainment of modern times. Life in and about the manor and monasteries may be considered.

5. The social and economic relationships of the different groups may be compared with conditions today.

The work may be done by directed study, by groups working together, or by socialized recitation. It may be motivated and vitalized by various forms of illustration, and by dramatization, outlines, and oral and written reports.

This problem may be made introductory to a more extended study of feudalism, the development of industries, the rise of guilds, the breaking up of the church into different denominations, or the development of new forms of government.

Problem 3: Eighth Grade

Purpose. To prepare pupils for making a proper evaluation of their own government by comparing its development with the steps in the evolution of another government.

Problem. To trace and compare important steps in the development of the governments of England and the United States.

Procedure. 1. Pupils in the eighth grade will already be somewhat familiar with the development of their own government. A general review may be made as a preliminary step to the introduction of the problem to be studied. Such matters as the appointment of governors by kings, the selection of councilors in the colonies, the organization of states, the period of the Confederation, and the adoption of the present constitution may be outlined.

2. The class may be divided into groups for the study of the new problem. One group may represent the resisting kings; another, the barons; another, the House of Lords; still another, the House of Commons; and so on. Each group may be requested to find out how it came into existence, how it is selected today, what its duties and privileges are, and so on.

3. Among others the following topics may be considered:

a. The kings as conquerors.
b. The barons question the king's authority.
c. The "Great Charter."
d. The development of Parliament.
e. The House of Commons and the levying of taxes.
f. Selection of kings.
g. Selection of members of Parliament.
h. Changes in the powers of the two Houses of Parliament.
i. Government of the English colonies.

4. Comparison of the present governments of England and the United States:

a. The House of Commons with our House of Representatives.
b. The House of Lords with our Senate.
c. The king with our president.

This problem may be used to introduce others, such as the origin and the development of courts, the development of cabinets, the organization of armies, the foundation of schools, or wars in America caused by conditions in Europe. In brief, there are few problems dealing with the development of American institutions that are not in some way connected with conditions in Europe.

XI. CIVICS IN THE MIDDLE GRADES

How civics came into the schools. Dawson[1] states that when democratic ideals began to spread with the founding of the United States government, Elhanan Winchester, a conservative, wrote the first book on civil government published in this country, for the distinct purpose of combating certain principles which came to be known as "Jeffersonian democracy." Winchester's book was entitled *Plain Political Catechism, Intended for use of Schools in the United States of America, wherein the great principles of Liberty and of the Federal Constitution are laid down and Explained by way of Questions and Answers, made level to the lowest Capacities.*

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[1] Edgar Dawson, "Beginnings in Political Education," *The Historical Outlook*, Vol. IX, p. 439.

Again, Dawson points out that beginning with about 1830 and continuing for some years, or during the period when Andrew Jackson and his followers were in control of the government, different textbooks on civics were published. Those written by William Sullivan (1830), A. W. Young (1836), E. D. Mansfield (1836), Charles Mason (1842), and J. B. Shurtleff (1845) are named and described. These books dealt almost exclusively with the structure and functions of state and Federal constitutions. Though it was asserted in the several titles that Winchester's book was "made level to the lowest Capacities," that Young's was "adapted to Purposes of Instruction in Families and Schools," and that Mason's was "designed for the Use of Schools and Academies and for the General Readers," it does not seem probable that these books were used to any considerable extent in the elementary schools.

Just when civil government was first introduced into the elementary schools is difficult to determine. Cubberley states that Noah Webster's introduction of the Constitution into his United States history in 1832 "marked the beginning of the study of Civics in our grammar schools."

During the period of the Civil War few textbooks were written, but an effective preparation was made for a broader conception of the meaning of the Constitution. As Judd[1] puts it, "A new national consciousness had been born . . . , and there was no doubt even in the mind of the common man as to the significance of our national government and its machinery." The privileges of citizenship became greatly enlarged.

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[1] Charles H. Judd, "The Teaching of Civics," *The School Review*, Vol. XXVI, p. 513.

With the close of the war the education of the masses for exercising the rights of citizenship became a matter of national importance. Dr. Joseph Alden's *Citizen's Manual, A Textbook on Government for Common Schools* seems to have been one of the first books in civics prepared especially for the intermediate grades. Judd, who examined textbooks on civics published at intervals from the close of the Civil War to the time of the World War, points out that while Alden's book dealt almost entirely with the Federal Constitution, other books soon began to include discussions of state, county, city, and town organizations. As texts of this type he cites Martin's *Text Book on Civil Government in the United States*, published in 1875, and Macy's *Our Government*, published in 1886. These books were used in the upper grades of the elementary schools and in the high schools.

Committee influences. Between the close of the Civil War and the outbreak of the World War different organizations contributed to the development of civics teaching in the schools. In 1869 the National Teachers' Association urged the necessity of teaching United States history in the schools, "especially with reference to the principles, the structure and history of our Political Institutions." The Association suggested that colleges should "require a fair knowledge of it as a condition of admission."[1] This was suggested as a means for stimulating the study of civics in the schools.

Notwithstanding the appearance of many textbooks and the desire of educational leaders to stress the subject, the study of civics made little headway, and the subcommittee of the Committee of Ten found in 1892 "that only about one sixth of the elementary schools and one third of the high schools were giving any instruction in civil government."[1] This committee, known as the Madison Conference, "recommended the study of civil government in the eighth grade of the grammar school and in the last year of the high school." In 1895 the Committee of Fifteen recommended "that there should be given a study of the outlines of the Constitution for ten to fifteen weeks in the last year of the elementary school." Different committees from historical and political-science associations wielded great influence in giving trend to social-science teaching in the schools. The members of these committees, which were dominated by college influences, were not in agreement with regard to the treatment that civics should receive: the workers in history wished to continue the control of civics teaching as an integral part of their own subject, whereas the political-science representatives asked that civil government be made a separate subject.

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[1] Paul Monroe, *Cyclopedia of Education*, Vol. II, p. 24. Reprinted by permission of The Macmillan Company, Publishers.

The influence of certain individuals. While the various committees were wrestling with the social-science problem, another group arose to challenge college control. This group was composed of teachers in the schools, who were fortunate to have as their leader Professor John Dewey of the University of Chicago, who held that to prepare children for life they should be surrounded by life conditions in the schools. That his theories might be given physical demonstration, he opened a school at the University of Chicago in 1896. This school soon became a Mecca for those in search of modern things.

Among those who came under Dewey's influence was Arthur William Dunn, a graduate of Knox College, Galesburg, Illinois. Dunn received his degree of Bachelor of Arts in 1893, studied at the University of Chicago from 1893 to 1896, served as instructor in English and as lecturer in sociology at the University of Cincinnati from 1896 to 1898, and then returned to the University of Chicago as fellow in sociology for a period of two years. Professor Dunn became thoroughly saturated with Dewey's ideas, and in the preface of his first book, *The Community and the Citizen* (published in 1907), he acknowledges his indebtedness to Professor Dewey for the general idea developed in that book.

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[1] Paul Monroe, *Cyclopedia of Education*, Vol. II, p. 25. Reprinted by permission of The Macmillan Company, Publishers.

In his book Dunn uses his home town, Galesburg, as a basis for the study of community relationships. From 1900 to 1910 Professor Dunn served as director of civic education for the public schools of Indianapolis, where he attracted national attention because of the community-civics program worked out for that city. It is not too much to say that the ideas of Professor Dewey as worked out by himself and by Professor Dunn and others are revolutionizing the teaching of civics in the schools of the United States today.

XII. THE NEW TYPE OF CIVICS MATERIALS

The nature and sources of materials. Since the publication of Dunn's *The Community and the Citizen*, the point of view from which textbooks on civics are written has been greatly changed. Instead of beginning with the state or Federal government, teachers are now asked to begin with local community relationships. The care and use of city streets or country highways, the provision of public utilities, community health, schools, libraries, forms of amusement, local government, the interdependence of local industries, with other similar problems, furnish the points of departure for studying the social relationships from the standpoints of larger units, such as the county, the state, the nation, or other countries of the world.

In view of the theory that civics should begin with a study of the social problems of the local community, it is clear that every community must to some extent work out its own course of study. Many schools have already accepted the responsibility, and different courses are now available. Among the earlier and more notable of these, the ones prepared for Indianapolis and Philadelphia may be mentioned; among the more recent courses of value those of Los Angeles, Baltimore, Denver, and St. Louis may be cited.

So great has become the interest in the social studies that the United States Bureau of Education has published the recommendations of different national committees as to the teaching of civics in the schools. Among these publications may be cited the one on *Community Civics* (1915), the one on *Social Studies in the Secondary Schools* (1916), and three series of *Lessons in Community and National Life* (1917–1918). Parts of these bulletins deal with materials suited to the middle grades. From year to year the *Historical Outlook* has been giving outlines of courses prepared for different communities throughout the United States. Various institutions in connection with laboratory schools are working on courses in the social studies. Among these may be named the Laboratory Schools of the University of Chicago and the Lincoln School, New York. An outline of work for Grades 1 to 8 may be found in the *Minimum Course of Study* prepared for use in the schools of southern California. Textbooks dealing with the social problems of rural and urban life are now available. Some of these books are intended to be used as readers; others, prepared for the elementary and junior and senior high-school levels, are intended for use as textbooks.

Materials on the different school levels. For the first three years in school the child should be taught his obligations to himself, to the members of his family, and to his teachers and schoolmates. He should be drilled in habits of personal hygiene and politeness. He should learn to respect his own possessions and the property of others. He should be taught to play games and to respect the rules.

By the time he reaches the fourth grade he should become interested in community problems. The fire department, the water supply, the health of the community, the care of the streets or roads, the support of schools, parks, or libraries, may be made subjects for investigation.

In the fifth grade attention should be given to various local and county organizations that have to do with caring for the health of people, with maintaining good order, with charities, with schools, with good roads, etc. These organizations will include the local and county courts, boards of education, county commissioners, the police force, and various voluntary organizations, such as civic clubs or child-welfare associations.

The work of the sixth grade may be directed to state organizations. The different departments of the state government may be studied and related to corresponding divisions of the local government. The state health officer, the adjutant general, the state superintendent of public instruction, the secretary of agriculture, as well as other state officers, may be considered with reference to their services to local communities. Attention may be given to different state institutions, such as colleges and penal and eleemosynary institutions; to state boards, such as the railroad commission and the highway commission; and to the various boards of inspection. Functions rather than structure of organizations should be stressed.

In the seventh and eighth grades attention should be turned to the more important structural phases of state government and to the functions of different divisions of the national government. In the ninth, or last, year of the middle grades, pupils should be allowed to study occupations. The study should include such topics as intellectual and physical requirements, future prospects for promotion and service, relationships to other lines of business, the physical and financial dangers involved in various callings, and the like. The course in occupations may properly follow the exploratory courses given in the seventh and eighth grades.

XIII. METHODS FOR TEACHING CIVICS

Participation and expression. Formerly, pupils were drilled in the "anatomy of government"; today the stress is placed upon the function and hygiene of institutions. Mere knowledge of laws will not insure their observance — their only excuse for being. The study of civics may be motivated best through actual participation in home, school, or community life.

Pupil participation in class and school control furnishes excellent opportunity for teaching the fundamental principles of group relationships. This does not mean that boys or girls in the middle grades will be able to govern themselves, but it does mean that they will do much toward that end if they are properly instructed in social relationships. One of the troubles in the past has been that children were commanded to do things without understanding the reasons why. The claim that children should be taught obedience is only a half-truth. Obedience with understanding is the only kind that will produce a self-respecting and self-governing citizenship.

School and community organizations, such as the Boy Scouts, the Hi-Y, and various class or school clubs, furnish splendid opportunities for studying the civic problems of community life. These organizations may be made the forerunners of those that will be met with in adult life.

Many of the types of teaching used in other subjects are equally applicable in teaching the principles of social control.

Dramatization, discussion, pictorial representation, oral or written recitation, observation, and drill may be applied.

Today it is proposed to use not one textbook but many. Local, state, and national newspapers, and publications of local, state, and national governments, of various kinds of institutions, and of voluntary organizations, should be used. Pupils should be taught to discover problems and then to gather materials for their solution.

It is not proposed that lessons in civics should consist of gossiping about local or personal affairs. A worthy series of topics should be selected for each year's work, and the problems should be made increasingly comprehensive from year to year.

XIV. TYPE PROBLEMS IN CIVICS

Problem 1: Fifth Grade

Ultimate aim. To prepare pupils for participation in public-welfare organizations of the community in which they live.

Immediate aim. To lead children of the fifth grade to understand the workings of a community-welfare organization.

Problem. To study the organization and workings of a chamber of commerce.

Sources of materials. Publications of chambers of commerce, maps of city and county, lists of industries of city and adjoining territory, names and locations of competing markets, highway and railroad maps, census reports showing the composition of the population of the district, etc.

Procedure. 1. This problem may be introduced at a time when the local chamber of commerce is launching a drive for a new factory, the beautifying of the streets, a clean-up campaign, or is engaged in entertaining visitors from another part of the state. The study may be opened by asking such questions as the following: Why does the town have a chamber of commerce? Who may belong to it? What are some of the things that a chamber of commerce may do for a town?

2. If possible, a visit should be made to the headquarters of the local organization. There, exhibits may be examined and pieces of literature may be secured. The secretary may be willing to explain something of the workings of the organization.

3. A study of the purposes and activities of the organization may then be undertaken in detail. These may include (1) a study of the community's resources and needs, (2) the best means of advertising, (3) maintenance of service stations, (4) entertainments for visitors, (5) preparation and care of exhibits, (6) stimulation of new enterprises, (7) preparation and distribution of information, (8) coöperation with other civic organizations, (9) coöperation in securing legal enactments and the enforcement of community regulations, (10) organization and support of a chamber of commerce.

4. Pupils may be divided into groups for the study of different phases of the work. Reports may be made to the class. As the work proceeds, outlines and summaries will be of value.

5. After proper headway has been made the study may be dramatized by organizing a chamber of commerce in the class. Committees may be appointed, and recommendations may be made, discussed, and adopted or rejected by vote of the members.

6. Finally, the services of the class may be tendered to the local chamber, and actual work done in connection with securing public safety, in keeping the streets clean, in distributing advertising matter, and so on.

Problem 2: Sixth or Seventh Grade

Aim. To lead pupils to understand and appreciate the inter-relationships of the local, county, and state divisions of government.

Problem. To study the interdependence of the different divisions of a state school system.

Procedure. 1. If the organization of the local school system has been studied in a lower grade, the work already done may be reviewed. If such a study has not been made, such questions as the following may be raised: Why do we have a system of public schools? Who pays for them? How is the money collected? Who control the spending of the money? How do school officers secure their positions? What requirements are made of teachers by the state? by the local school boards? These questions may lead immediately to a study of local conditions.

2. In the course of the study it will soon be discovered that the selection and duties of different sets of officers will be involved in the problem. In the common schools local trustees, county superintendent, county-attendance officers, etc. will be found necessary; in the city schools a different organization will be encountered. Soon it will appear that the local officers are bound up with state officers. Such matters as local and state funds, provisions relating to textbooks, building, the school census, teachers' certificates, reports, classification of schools, will come up for consideration.

3. Assistance in the study may be obtained from teachers, parents, and school officers. Different groups of pupils may work on different phases of the problem. One group may deal with the school population; another, with schoolbooks; still another, with the selection of teachers; and so on. Blanks, school regulations, and simple interpretations of school laws may be used in explaining the phases studied.

4. Parts of the study may be dramatized. The school census of the class may be taken on real blanks, a school board may be organized, or a state department of education may be set up by the pupils. The problem will provide plenty of oppor-

tunity for pupil initiative, research, and organization of materials. Reports, discussions, outlines, and final arrangements of the findings will be necessary. Individual work, group study, and class participation may all be employed in handling the problem.

Work on this problem will pave the way for the study of others, involving the coöperation of local, county, and state authorities, such as health departments, police force, courts, good roads, etc.

XV. CHAPTER SUMMARY

In the development of civilizations many individual and group relationships have become necessary. To carry on these relationships certain bodies of knowledge have been accumulated. These bodies of knowledge have been named history, civics, economics, and so on.

The phases of the social studies most commonly found in the middle grades are geography, history, and civics. The first of these subjects was organized by Carl Ritter more than a hundred years ago; history and civics were first introduced into the schools in the early part of the last century; but none of the three made great headway in the elementary schools until after the Civil War.

As shown by the textbooks used, the materials in geography, history, and civics were fragmentary, formal, and usually beyond the comprehension of boys and girls from nine to fifteen years of age. Much of the geography was of a physical or mathematical type, the history dealt largely with wars and conquests, and the civics related to the structure of governments rather than to their functions.

Many of the early textbooks in geography, history, and civics proposed for use in the middle grades were merely condensed forms of books prepared for advanced students. Not until the last decade of the nineteenth century did they become suited, in a measure, to the interests and needs of pupils from nine to fifteen years of age.

While Rousseau, Pestalozzi, Herbart, and others laid the foundations of modern methods in the social subjects, almost a century passed before the principles of teaching advocated by these great educational reformers gained much headway.

With a better realization of the value of sense perception in teaching has come the demand for the use of more object materials in the schools. This demand has made the geography class turn from books to fields and factories, the history class from a recital of war fatalities to a study of the origins and developments of present-day institutions; and the class in civics, instead of beginning with the national Constitution, now takes up the study of government in the local community. Whereas children were formerly expected to learn many facts that they might later understand and use in civic life, they are now taught to grow up in citizenship by putting into practice in their daily living the fundamental principles of social control, learned at first hand through a study of social institutions.

EXERCISES

1. Explain how the social sciences became organized as separate subjects.

2. Secure early textbooks in geography, history, and civics and compare their contents with the contents of similar books now in use.

3. Compare the methods proposed by Pestalozzi and Herbart for the teaching of history and geography.

4. Make a study of the work of the National Herbart Society in America. What became of it?

5. Learn what the Committee of Ten and the Committee of Fifteen of the National Education Association recommended with regard to social studies for Grades 4 to 9 inclusive.

6. Make lists of present-day textbooks in geography, history, and civics suitable for use in the middle grades.

7. Discuss the advantages and difficulties of attempting to organize the social sciences about practical problems of daily life.

8. Make five problems, each of which will require subject materials from three of the social subjects for its solution.

9. Suggest five social projects that might be undertaken by a group of sixth-grade pupils.

10. Make an outline of subject matter and procedure for teaching a lesson in American history by the method of directed, or supervised, study.

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CHAPTER IX

MAN'S RELATIONSHIPS WITH THE PHYSICAL WORLD

I. THE ORIGIN AND DEVELOPMENT OF THE NATURAL SCIENCES

Man and the vegetable kingdom. In the preparation of the world for the home of man plant life preceded animal life; for long periods of time great forests and many kinds of vegetation grew on different parts of the earth's surface. Later some of the forests became buried and were changed into the fuel supply with which we now warm our houses and conduct great industries.

At first animal life fed on vegetable life without any thought of conserving or perpetuating the supply. Even today there are those who are willing to destroy the forests with a total disregard of the needs of future generations. But as man became more civilized he came to regard the future welfare of plant life as concomitant with his own. This attitude led him to cultivate and improve vegetable forms, to plant orchards for the benefit of future generations, and to clothe the earth with a more beautiful and productive vegetation than the one provided for him. The intimate relationships of man to the vegetable world led him to study its laws. This study is now pursued in the schools, where, in its advanced form, it is called botany; in its elementary form it constitutes a part of nature study, or general science.

Man and the animal kingdom. According to the source of food supply, animals may be divided into groups: herbivorous, those that live on vegetation; carnivorous, those that live on animals; and herbivorous-carnivorous, those that live on a mixed diet. Of the third class, man is the most conspicuous example. In the savage state man, in common with all carnivorous animals, found it necessary to capture his prey before he could feed upon it. Indeed, at first, the capture and destruction of one another occupied a considerable part of the activities of different members of the animal kingdom. As one writer states, "Food is the first object of desire, and all fins, legs, wings, and tails were developed either to get food or escape finding a grave in some other creature's stomach."[1]

Since man was physically weaker than some animals upon which he wished to prey, it was necessary for him to study their habits that he might capture them through strategy. By and by he learned that certain animals might be domesticated and made not only to furnish him with food but to bear his burdens. This changed his attitude from one of ruthless destruction to one of preservation and development. Thus man has made use of some lower animals in controlling other divisions of the natural world. This caused the propagation, care, and use of animals to become an important branch of the study which has been denominated zoölogy, or the study of animal life.

Man and nature's inanimate forces. Man dwells in a world of inanimate forces. The earth on which he lives is dependent on other worlds. Plants and animals are sustained by light and heat derived from the sun, the central body of the solar system. Man has learned that day and night, the procession of the seasons, the tides of the oceans, and the retention of the earth as a part of the solar system are caused by common forces operating upon the earth and other planets.

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[1] G. Stanley Hall, *Adolescence*, Vol. II, p. 9.

By making a study of physical forces man has been able to harness and direct them in his own service. With artificial light he illuminates the night or explores the caverns of the earth; with artificial heat he makes the frigid parts of the earth habitable by protecting himself and parts of the animal and vegetable kingdoms against the changes of the seasons. This knowledge of the world enables him to apply minerals to their uses and machines to his labors. He compels the air and the oceans to bear his burdens; he compels the lightning to carry his messages. Instead of looking upon natural forces as enemies, he now looks upon them as valuable servants. The study of heat, light, electricity, machines, and the forces of inanimate nature was formerly spoken of as natural philosophy; today, in its advanced forms, it is known as physics, and in its simpler forms it appears as a part of general science.

Man and the composition of physical bodies. It has been discovered that all substances in the physical world are composed of one or more among ninety elements. The air we breathe, the water we drink, and the food we eat may be broken up into their original parts; or the simple elements may be compounded into untold numbers of different objects. Knowledge concerning the manipulation of the elements of physical bodies is now looked upon as a necessary possession for those who prepare food, deal with animal or vegetable life, or develop industries. This knowledge is organized and presented as the subject known as chemistry.

Man and the earth's structure. Man has not only invaded the atmosphere, measured the distances and areas of other planets, organized mechanical forces, subjugated and improved the animal and vegetable kingdoms, and studied the chemical elements that compose the universe, but he has delved into the bowels of the earth to discover great treasures that add to his comfort and to the development of the race. Intelligent beings have learned to use the mountains, the rivers, the oceans, and the minerals as wise provisions for human welfare; consequently the study of the earth's structure, or geology, has come to be an important study in the schools. In the middle grades the term "physical geography" is used to designate the study of the natural features of the earth's structure.

II. HOW THE SCIENCES CAME INTO THE MIDDLE GRADES

Changes in names. Philosophy once included all sciences — mental, moral, and natural. When the different fields of knowledge were developed, they were given names: the one dealing with nature was called natural philosophy, or physics. Natural philosophy at first included all the natural sciences. Biology, which relates to life in general, includes both botany and zoölogy. With the further extension of knowledge, chemistry, zoölogy, and botany have been subdivided into special fields.

Alchemy became chemistry. Astrology was changed to astronomy and later appeared in the schools as mathematical geography.

It must not be understood that the changes in names imply no changes in subject matter. Chemistry is different from alchemy; so is astronomy different from astrology. In the main, however, the new names are used to denote further developments of old subjects, or the differentiation of certain parts of the field of scientific study.

Sciences in the high-school grades. While early civilizations developed the study of the sciences in the third and fourth centuries before the Christian Era, the beginnings of modern science may be traced to the sixteenth century. Astrology and alchemy flourished from the tenth to the fourteenth century.

All the major sciences were first taught in the colleges, but were given a prominent place in the academies in the last half of the eighteenth century and the first half of the nineteenth; finally, they were taken into the high schools in the last half of the last century. Cubberley[1] states that astronomy, botany, chemistry, and natural philosophy were prominent in the academies from about 1825 to 1840, and that by 1850 "the rising high schools were incorporating scientific studies quite generally." The instruction was by the textbook method, "but some lecture table demonstrations had begun to be common." Brown[2] reports that in a small three-year high school in central Illinois (about 1880) the pupils studied in their senior year, among other subjects, natural philosophy, zoölogy, astronomy, physiology, and chemistry for about one third of a year each. He says, "I do not think this instance was exceptional."

The Committee of Ten protested against the "multiplicity of short information courses, especially in the natural sciences."

Beginning with the last quarter of the last century and continuing well into the present century the colleges dominated the teaching of science in the high schools. The problems selected and the laboratory work performed were outlined in accordance with college-entrance requirements and college methods of teaching. This failed to bring satisfactory results, and this failure later led to a reorganization of materials and methods in high-school science.

Sciences in the lower grades. While the sciences were trickling down into the high schools, object teaching began to appear in the lower grades. Although scientific studies had been introduced into the Realschulen of Germany by the middle of the eighteenth century, object lessons did not become popular in England until after 1830 and did not reach America before 1860. The so-called object lessons copied from Pestalozzi were formal affairs. Cubberley[1] states:

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[1] E. P. Cubberley, *The History of Education*, p. 775.

[2] E. E. Brown, *The Making of our Middle Schools*, p. 417.

> In 1871 Dr. William T. Harris, then superintendent of the city schools of St. Louis, published a well-organized course for the orderly study of the different sciences. This attracted wide attention, and was in time substituted for the scattered lessons on objects which had preceded it. This in turn has largely given way, in the lower grades, to nature study.

Fusion of the sciences in the middle grades. The almost countless inventions and applications of science to different phases of domestic, industrial, and commercial life in the last fifty years have brought scientific principles within the immediate interest of many people. This has led to a demand for science teaching on all levels of school instruction.

The object lessons and the elements of the sciences formerly proposed for the lower grades, as well as the science work introduced into the high schools from the colleges, lacked motivation, and so proved uninteresting and unattractive to young people. With the development of modern modes of travel, new forms of entertainment, the application of machinery to the home, the farm, and the factory, additional means of communication, the many kinds of recreation, such as gardening, caring for animals, amateur photography, and traveling, real motives have been furnished for understanding the workings of natural laws in common things. As a result of the new interests, science work in the middle grades is now reaping the benefits of previous experience in the other grades. From the old "nature study" of the lower grades we are taking the idea of using vast amounts of concrete materials, from the old theory-books used in former years in the high schools we secure the great principles upon which the sciences are constructed, and from the experiences of everyday life we select problems of immediate interest to growing minds. These factors are so blended that while facts are learned, problems solved, and nature's laws mastered, the work is done with enthusiastic interest and practical effectiveness. It has been discovered that, by setting suitable problems, phases of the different sciences may be applied. This has led to the adoption of the term "general science," which means a fusion of the different sciences in the solution of problems that arise in the regular course of practical life.

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[1] E. P. Cubberley, *The History of Education*, p. 775. Reprinted by permission of Houghton Mifflin Company, Publishers.

III. CHANGES IN SCIENCE TEXTBOOKS

Science textbooks of the last century. While the sciences were taught in the academies and high schools as soon as these were opened, little attempt was made to introduce them into the middle and lower grades before 1860. As already stated, a complete course in elementary science was prepared for the St. Louis schools in 1871. About this time the Fourteen Weeks' Series was published by A. S. Barnes and Company. This series, prepared by Dr. J. Dorman Steele, comprised eight books bearing the following titles: *Natural Philosophy*, *Chemistry*, *Descriptive Astronomy*, *Popular Geology*, *Human Physiology*, *Zoölogy*, *Botany*, and *Key containing Answers to the Practical Questions and Problems in Steele's Fourteen Weeks' Courses*.

Before the appearance of the Steele series there were in use, among others, elementary books on science written by Denison Olmsted. These, however, never attained a position in the schools comparable to the Steele series. Maury began work on his physical geography in 1866. True it is that these books were used in the upper grades, but they provided the entering wedge for the introduction of the sciences into the lower grades. While the science work outlined for the elementary grades by Dr. Harris at St. Louis was taught by the oral method, the classification of all materials was stressed. This was in keeping with the form of science textbooks of that day.

It was not long until books on nature study and elementary science for pupils of the lower grades began to appear. Between 1870 and 1876 Dr. Worthington Hooker prepared a series of books published by Harper & Brothers, including *The Child's Book of Nature*, *First Book in Chemistry*, *Natural History*, and *Science for the School and Family*. The *First Book in Chemistry* was prepared for pupils eleven or twelve years of age and was written, so the author states, in response to the request of a mother who had experienced great pleasure in teaching *The Child's Book of Nature* to her little daughter. While the book was being written the subject matter was tried out with pupils in the New Haven public schools. The author recommended that the *Book in Chemistry* be preceded by his *Book of Nature* and be followed by the science book. These books are of the descriptive and experimental type and represent the beginnings of the transition from the so-called "elementary science" to "nature study," or the change from the classification of plants, animals, minerals, and the like to a description of their appearances, characteristics, and uses.

Beginning about 1880, books began to appear whose purpose was the simplification of the subject matter in the high-school sciences. Such a series was the one prepared by Professor E. J. Houston and published by Eldredge and Brother. This series included *Easy Lessons in Natural Philosophy*, *Intermediate Lessons in Natural Philosophy*, and *Elements of Physical Geography*. Although these books were generally prepared for high schools, some of them would not be beyond the understanding of pupils in the upper middle grades of the present day.

Alongside the more formal texts on elementary science and nature study, series of natural-history readers began to appear. A good illustration of this type of book was the one prepared by James Johonnot, and published by the American Book Company about 1885. The nature of these books is suggested by their titles: *Book of Cats and Dogs and Other Friends*, *Friends in Feathers and Fur, and Other Neighbors*, *Neighbors with Wings and Fins*, *Some Curious Flyers, Creepers, and Swimmers*, *Some Neighbors with Claws and Hoofs, and their Kin*, and *Glimpses of the Animate World.* Before the end of the century nature and science readers were available for all primary and intermediate grades.

In addition to books on object study, elementary science, nature study, and nature readers that appeared in the last century, one other type of book should be mentioned — the laboratory manual. This was a donation from the colleges and one that proved at first injurious to the teaching of science in the schools. The injury came from a selection of experiments too remotely related to the interests of the pupils as well as from the rigid form prescribed for dealing with the problems suggested.

Science textbooks of more recent times. The last fifteen or twenty years have witnessed radical changes in the science textbooks used in the middle grades. In the first place the lines separating the different sciences have been destroyed; instead of having a book for each phase of science, such as chemistry or botany, we now have books on general science which include problems involving principles drawn from various sciences. While the work in the fourth, fifth, and sixth grades is still known as "nature study," and while the work in the seventh, eighth, and ninth grades is usually denominated "general science" or biology, the real nature of the work in the lower grades is little different from that of the upper grades except in the degree of advancement. The more specialized forms of the sciences are left for the senior high school and college.

A second change encountered in the science textbooks of the present day is the emphasis placed upon the practical problems of everyday life. The older books contained definitions, laws, and the classifications of materials; the books of today contain descriptions, concrete data, and familiar problems with suggestions for their solution. The older books were said to be logical and scientific; the later books, psychological and empirical.

Probably the greatest difference between the science books of the last century and those of the present is the relative importance placed on artificial and natural objects. Though Pestalozzi and his followers stressed the use of natural objects and the nature-study advocates called for the use of natural materials, the textbook and artificial laboratory equipment came to dominate science teaching in the schools. In recent times the laboratory has been extended to include the field and the forest, the museum has been enlarged to include the garden and the zoölogical park, and the chemical laboratory is now joined with the kitchen and the factory. In short, instead of dominating science study in the middle grades, textbooks of the present day are looked upon merely as guides or means for interpreting nature or nature's laws with which pupils live in immediate contact.

IV. NATURE MATERIALS FOR THE MIDDLE GRADES

Beginnings assumed. Because of traditional attitudes toward reading, spelling, writing, and number work, it has been difficult to secure a place for nature study in the primary grades. Even today in many schools which possess an outline for nature-study work the proposal is much beyond the realization. In some schools, however, excellent use is made of nature materials, and there is every reason to believe that the relationships of children to the physical world about them will receive more attention in the future than they have in the past.

Before proceeding to any outline of nature materials for the different years of the middle grades, attention should be called to certain mistaken ideas that have grown out of the use of such terms as "object lessons," "elementary science," "nature study," and the specialized classifications of nature materials such as botany, geology, chemistry, and the like. Too frequently these terms have been taken to mean that one type of thing was to be studied in the primary grades, another type in the middle grades, and still another in the upper or high-school grades. The point is here made that the child is constantly coming in contact with animal and vegetable life, with chemical and physical changes, with the effects of the sun and moon upon the earth, and with the natural features of the earth's surface. While, of course, his powers of comprehension in the lower grades are limited, he may nevertheless understand something of nature's laws in every field. In other words, in his advancement from grade to grade the child is being introduced not to new phases of the natural world but to enlarged phases. Furthermore, there is no more reason for postponing a study of the physical world to the upper grades than there is for disregarding the social life of which the pupil is an integral part.

What, then, should the child in the primary grades learn about the physical world? He should learn to observe, name, and handle or avoid the common plants in the house, yard, and garden; he should observe the forms, foods, and habits of pets and domestic animals; he should learn something of the effects of heat, light, and moisture on seeds and plant life; he should become interested in weather changes and their effects on animals and plants; he should be taught to observe the outline forms of mountains, valleys, and rivers within reach of his own home; finally, he should not be required to read "Twinkle, twinkle, little star; How I wonder what you are," without being directed to look into the sky at night. These are the beginnings of botany, zoölogy, physics, geography, and astronomy which every child who completes the first three grades in school is entitled to know.

Nature materials in the fourth, fifth, and sixth grades. The location of the school will have much to do with the selection of nature materials. Few localities will possess all advantages, but none will be without some natural objects. Plains will differ in nature materials from mountain ranges, prairies from forest lands, arid regions from areas of abundant rainfall, rivers from seashore, countries in southern latitudes from countries in northern latitudes, and low levels from highlands. Since animals and plants, temperature and moisture, mountains and valleys, food and clothing, winds and waters, fields and forests, skies and clouds, are to be the subjects of study, it is clear that no one selection of nature materials will be suitable to all parts of the country.

The sixty-one lessons worked out by Cummings[1] at the University of Utah for the fourth grade included a study of clouds, winds, stars, trees, heat, erosion, soils, gardens, orchards, insects, birds, and bees. (It should be noted that a systematic course in nature materials covering the first three years of school life is intended to precede the work outlined for the fourth grade.) In the fifth and sixth grades Cummings would have the pupils continue the study of climatic conditions, the propagation and uses of animal and vegetable life, the earth's structure with reference to coal beds and fossil remains, animal coverings, building materials, the development of transportation as related to physics, insects as related to plant life, and plants and animals as related to the life of man.

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[1] H. H. Cummings, *Nature Study for Lower Grammar Grades and Nature Study for Higher Grammar Grades*. American Book Company.

To those familiar with nature materials about Salt Lake City and throughout the state, Cummings's selection of topics will seem well suited to children in Utah. His list will suggest a suitable procedure for the selection of nature materials for other localities in the United States.

Nature materials in the seventh, eighth, and ninth grades. Beginning with the seventh grade, nature materials may continue with an elaboration of the topics studied in the lower grades. They may turn more to human anatomy, physiology, and hygiene; they may stress phases of the physical sciences, such as household physics and chemistry; they may give more attention to phases of the biological sciences; or they may include applications of elements of the different sciences to the home, the garden, the fields, and the shops. Scores of books have been written for the pupose of advancing the several ideas with regard to teaching the sciences in the upper grades of the elementary schools. If the theory that everyday problems should determine the science materials to be used, then many books will be needed instead of one. Furthermore, these books should cover many phases of nature materials.

Such problems as the lighting and heating of the home, the effects of climatic conditions on plants and animals, the effects of the motions of heavenly bodies, the transmission of sound, the interdependence of plants and animals, sources of food supply, mechanics as applied to home and factory uses, soils and field products, natural and artificial forms of electricity, changes in the earth's surface, properties of minerals, chemical changes as revealed in rust and combustion, food composition and digestion, all furnish motivation for the highest type of science study. To relate scientific principles to health, to food preparation, to household problems, to gardening, to the care of animals, to problems of clothing or shelter, to an understanding of nature's laws such as gravitation, winds, ocean currents, rainfall, to the cultivation of the fields, to the application of levers, inclined planes, steam, and electricity to transportation and the manipulation of machinery, should be the primary object in teaching science materials in the seventh, eighth, and ninth grades. The more specialized forms of the sciences, such as astronomy, botany, zoölogy, physics, chemistry, and geology, should be left to the upper grades of the high schools and to the colleges.

V. METHODS AND NATURE MATERIALS

Early methods in the sciences. Aristotle was the greatest of the Greek scientists. He wrote treatises on physiology, "natural history" (or biology), "mechanics," and "natural philosophy" (or physics). Astronomy, chemistry, geology, and geography did not take their present form until many centuries later. While Aristotle is said to have used the inductive method in classifying plants and animals, his greatest work on method was the *Organon*, a complete analysis of deductive reasoning. It was necessary, however, to wait for nearly twenty centuries after Aristotle's work appeared for a clear statement of the inductive procedure in scientific study.

According to Cubberley[1] "the beginnings of all modern scientific investigation date from 1543." This was the date of the publication of *De Revolutionibus Orbium Celestium*, by Copernicus. This work upset the idea that the earth was the fixed center of the universe, a theory advanced by Ptolemy A. D. 138. In the establishment of the new theory Copernicus used inductive reasoning. Galileo, Newton, Harvey, and other great scientists adopted the inductive approach in their scientific investigations.

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[1] E. P. Cubberley, *The History of Education*, p. 387.

In 1620 Francis Bacon published his *Novum Organum.* This constituted the first clear statement of the inductive method, which had been in use for a considerable time. The *Novum Organum* of Bacon took the place of the *Organon* of Aristotle and laid the foundation for later scientific study and modern science teaching.

Someone may ask, Why wait so long for the change from the deductive to the inductive method in the schools? In the first place, many of the first scientists were not connected with institutions of learning. When the higher institutions did admit the sciences they undertook to teach them by the method used in dealing with other fields of knowledge.

In 1730 Linnæus was appointed assistant to the professor of botany at Upsala and became the founder of modern botany. He examined eight thousand plants in preparation for his work entitled *Genera of Plants.* While his classification is based upon artificial distinctions, his work was published in many languages and continued to wield a great influence among botanists for a hundred and fifty years. Whether we turn to the history of method or to an examination of the textbooks used, we must conclude that the lecture, the textbook, description, demonstration, and classification continued to be the procedures for teaching the sciences until well into the latter half of the nineteenth century.

Later methods in the sciences. To the older procedures the nineteenth century witnessed the addition of representation, experimentation, and a wider use of natural objects in teaching.

According to Brown,[1] Rensselaer Polytechnic Institute, founded in 1824, required that chemistry and physics should not be taught "by seeing experiments and hearing lectures according to the usual method," but that the student should be required "to lecture and experiment by turn under the immediate direction of a professor or competent assistant." Brown further states that the first chemical laboratory in the United States for applying chemistry to the arts was opened by James C. Booth, an early student at Rensselaer, in the Franklin Institute at Philadelphia in 1836.

It should be recalled that between 1825 and 1850 the sciences were being rapidly introduced into the academies and high schools. In 1862 a visitor to the Central High School of Philadelphia reported that students in chemistry were being taught to perform experiments for themselves.

Comenius advocated the use of pictures in teaching the sciences, Rousseau approved the employment of pictures only when the objects were not available, and Pestalozzi thought that drawings would bring out more clearly the structure of the objects studied.

Steele's *Fourteen Weeks in Zoölogy*, published in 1872, advocated the skeletonizing of animals, the collection of eggs and nests, and the study of the habits of domestic animals and fowls and of insects.

In the preface to his *Fourteen Weeks in Chemistry*, published in 1873, Steele advised the application of chemistry to problems arising in the home and on the farm. He proposed that the topical method of recitation be adopted. In the suggestion with regard to the application of chemistry to practical problems we find him in accord with the beliefs and best practices of modern times. It may also be noted that he advocated the use of natural objects in teaching.

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[1] E. E. Brown, *The Making of our Middle Schools*, pp. 419–420.

Further testimony showing an increase in the use of natural objects in science teaching may be found in the preface to Colton's *Elementary Course in Practical Zoölogy*, published in 1886, where the author says, "The only way to know animals is to see and handle them." Colton outlines the following plan for studying animals: (1) directions for collecting and preserving specimens, (2) life of the animal to be studied, (3) external features to be noted, (4) animal to be dissected, (5) development of a few forms to be studied, and (6) classification. Textbooks on botany published in the same period reflect a similar procedure for the study of plant life.

From the references given we may conclude that in the last century the methods of teaching science changed more or less from the deductive procedure to the inductive. Laboratory work was substituted to a considerable extent for lectures and demonstrations. Increased use was made of natural objects. Books on science were greatly improved by the addition of drawings and pictures. Some attempt was made to arouse interest through the application of science to practical problems, but it was necessary to wait until the new century for much progress along this line. The rigid laboratory methods imposed upon the schools by the colleges had failed to arouse interest in the sciences. Mere descriptions and classifications of objects did not appeal to young people. By the end of the century the sciences had slipped down into the lower grades in the forms of "nature study," "nature readers," and "short courses in science." A new psychology was beginning to appear. The application of the sciences to industrial life attracted the attention of educational leaders, who began to question the results of teaching science by the existing methods.

Present-day methods in the sciences. The beginning of the present century found a strong tendency developing for reorganizing and popularizing the sciences in the schools. The lines separating the different phases of science were giving way, as shown by the appearance of books on nature study and biology. Laboratory manuals began to incorporate problems of the home, of the stream, of the woods, and of the shops. The attitude that came to prevail is expressed by L. H. Bailey in the preface to his *Beginners' Botany*, published in 1908, in which he says, "If the pupil does not know the living and growing plant when he has completed his course in botany, he has not acquired very much that is worth while." Science teaching in the schools is henceforth to be looked upon as a subject dealing with life activities rather than as a book subject. This has led teachers and pupils into factories, into the open fields, and among living things, where the laws of nature are at work. The cultivation and development of the living world have been substituted for mere description and destruction of plant or animal life; the understanding and application of physical and chemical laws have been exchanged for a mere statement of their existence; in short, it is now proposed to substitute the manipulation of materials for the mere use of words.

At least three fundamental principles of method have been added to the teaching of science within the last quarter of a century. These principles are revealed in better motivation, in better selection of problems, and in a larger freedom granted to pupils in the solution of the problems and projects selected. Progressive teachers now know that in order for the pupil to gain a lasting benefit from study he must be genuinely interested in a subject. This has led to casting him into the midst of nature problems. The senses are put to work, the mind is aroused, the imagination is stirred. Stupid, indeed, is the individual who may not be guided to an interest in nature's workings. Successful science teachers place this interest in the forefront of all procedure. In the second place, it has come to be recognized that different phases of science may be required in the solution of a single problem. Principles of vegetable life may be applied to the solution of problems in animal life. Physics and chemistry, originally one subject, may both be called upon in solving a problem in bread-making or agriculture. These facts are now recognized in the selection of problems in science for pupils in the schools. Again, pupils are now asked to secure the solutions for their own problems and projects. Stimulated, guided, assisted? Yes. But the pupil is made to feel the responsibility for his own progress. He likes the challenge. In no other subject does the procedure outlined bring greater permanent results than in the teaching of nature's laws.

VI. UNITS OF WORK IN SCIENCE

Project for Fourth-Grade Pupils

Purpose. To develop in pupils an interest in plant life by means of a project in plant cultivation.

Project. To germinate seeds, to transplant and care for seedlings, and to study plant growth.

Procedure. 1. The amount of work already covered by pupils in the primary grades should be considered in setting up the proposed project. The proper starting point for the advanced work may be determined by permitting the pupils to tell what they know about the forms and structure of seeds, how seeds start to grow, what is necessary to start the sprouts, why it is best to start some plants in boxes before placing them in the garden, and so on. In this way the teacher may ascertain how much the pupils already know about plant propagation.

2. The pupils may know something of the contests carried on in tomato clubs, corn clubs, melon clubs, and the like, by

their brothers and sisters or by other children. If so, a contest may be proposed for growing some vegetables. In order to get ready for the planting, it may be suggested that it will be better to make sure that the seeds are good. This will call for experiments in seed selection.

3. The sprouting of the seeds under the most favorable conditions so that good strong plants may be secured will bring up the factors of soil, darkness and sunlight, temperature, and moisture. To show the process of germination, some seeds may be planted within and near the sides of glass jars with a dark paper covering that may be removed from time to time for the purpose of observing the stages of development.

4. The preparation of the ground for the baby plants will call for further study and work. When the ground and the sprouts are ready, the transplanting may be done and the cultivation may begin. The contest may consist in seeing how many pupils can save all the plants assigned to them, or it may be extended to include the size and amount of the vegetables produced.

5. Since some pupils may not have suitable places for carrying on the project, the class may work in groups. Records of the growth of plants, as well as observations as to their care, should be kept and reported to the class from time to time. Rapidly growing and quickly maturing plants should be selected for the project.

Problem for Fifth-Grade Pupils

Purposes. To arouse pupils to an appreciation of nature's provisions for the care of the animal kingdom and to lead them to an understanding of the part that the clothing of animals has played in the clothing of man.

Problem. To study the clothing of animals used in the clothing of man.

Procedure. 1. The problem may be taken up at a time of year when a change is being made from one weight of clothing to another. The uses of clothing, protection and decoration, may be discussed with reference to color, weight, cleanliness, and so on. Questions may then be asked as to whether animals change their clothing and what becomes of their old clothes.

2. When the problem is first presented, pupils will be likely to mention the use made of feathers, furs, and the like by savages or, possibly, by frontiersmen. If so, this lead may be followed in continuing the study. Why did early people take the clothing of animals for themselves? Why was it usually necessary to kill the animals whose clothing they desired?

3. Ways in which animals wear, clean, and change their clothing may be studied. Birds and domestic fowls may be observed bathing, and preening or shedding their feathers; animals may be found plunging into streams, and smoothing or rubbing away their hair or fur. Pupils may be allowed to bring in specimens of hair, fur, feathers, wool, scales, shells, etc. for observation by the naked eye and under the microscope. Here a list of the kinds of animal clothing used by man may be made. Silk, wool, feathers, fur, etc. may be named.

4. The ways in which man raises silkworms for silk, sheep for wool, ostriches for feathers, and so on, and his uses of the products without destroying life, mark a significant step in civilization.

5. While the feeding of silkworms with the gathering of silk and the manufacture of silk goods, the raising and shearing of sheep and the manufacture of cloth, and ostrich farming with the plucking and dressing of the feathers may be taken up as interesting problems, it should not be forgotten that the purpose of the original problem is to impress upon the pupils man's debt to the lower animals for a considerable part of his clothing. Pupils will be interested in the fact that man's ability

to move from one latitude to another and to meet the changing seasons with a minimum of discomfort comes in great part from his use of the clothing of animals as his own.

Problem for Sixth-Grade Pupils

Purpose. To lead pupils to appreciate the effects of water and wind upon the earth's surface through a study of changes going on in the mountains, valleys, and streams of the locality in which they are living.

Problem. To study the effects of wind and water upon the earth's surface.

Procedure. 1. A sandstorm or a heavy rain may be used as a starting point for the study. Piles of dust or sand dunes after a sandstorm in arid regions, swollen and muddy streams or changes in roads and fields after a rain, may be noted by pupils. The school yard, neighboring creeks or brooks, mountains, cañons, river beds, eroded rocks, etc. of the immediate neighborhood may be used as the finest types of teaching materials.

2. Reports of visits by pupils to deserts, cañons, or caverns may be used to arouse interest in the study. Pictures of the Grand Cañon, the Garden of the Gods, the Natural Bridge, desert scenes, and the like will be useful in the study. After these may come the use of contour maps, reading references, and visits to special points of interest.

3. In the course of the study the following questions, among others, may be raised: Why do rivers have different colors? Why are valleys usually more fertile than mountain sides? Why do rivers usually become broader and shallower near their mouths? Why do some fields erode more rapidly than do others? What factors would determine whether the surface of the earth would change more rapidly in a dry country than in a rainy country?

4. The problem may be extended to include the effects of erosion upon farm lands, the construction and maintenance of streets and highways, the navigation of rivers, the need for dikes along streams, the construction of highways and railroads through mountain passes. Changes in boundary lines marked by river courses, and even the changes taking place in the outlines of continents, in the elevation of mountain ranges, and in the depth of the sea, may be considered.

Project for Seventh-Grade or Eighth-Grade Pupils

Ultimate aim. To prepare for an intelligent and economical use of fuels in the home and in industries.

Immediate aim. To study the values and uses of the different fuels available in any community.

Project. To study, select, and use materials for building a fire.

Procedure. 1. Boy Scouts and Camp Fire Girls will be ready to give their experiences in building fires. Some pupils will also have built fires at home. Questions may be raised as to the kinds of fuel used, the difficulties encountered, and the degree of success attained.

2. Since the fuels available will vary from place to place, pupils may be led to enumerate those used in their own community. Forms of the following will appear in the list: gas, oil, coal, and wood. Electricity, steam, or hot water may be named as means of heating. If so, it will be necessary to lead the pupils to understand that these are secondary and not primary means for securing heat.

3. Further interest may be aroused by asking such questions as these: How many have ever bought a load of wood or a supply of coal? What was the cost? What different kinds of wood or coal may be secured in the community? Pupils may learn from parents or dealers the prices of different fuels.

4. Since fuels are sold at different prices, pupils may desire to know the reasons. Different costs involved in obtaining raw materials and in their preparation, transportation, etc. may be mentioned. Some pupil or pupils may call attention to the different qualities: some kinds of wood or coal burn better than others, or have other advantages. The names of the best kinds of wood and coal may be mentioned or learned from those experienced in handling fuels.

5. Lists of different kinds of wood and coal, with their respective prices, may be made. In coals lignite and various grades of soft and hard forms may be studied; in woods pine, cedar, oak, willow, hickory, etc. may be discussed, evaluated, and priced.

6. In the use of fuels, why is it that some take fire quickly and others start slowly? As a step toward answering this question pupils may be guided to arrange in order the names of fuels according to the degree of readiness with which they burn. Some such list as the following may be arranged: gas, oil, thin dry paper, small pieces of dry wood, small lumps of coal, etc. In the arrangement of the lists such questions as the following may be asked: Why will gas start more quickly than oil? Why will dry paper burn more readily than wet paper? Why will small pieces of wood burn more easily than large pieces? Pupils may need help in understanding the meaning of "kindling point," the mixing of gases in combustion, and the value of carbon in fuels, but when they understand these facts they will be prepared ever after to handle fuels more intelligently and economically.

7. The project will not be completed until a fire is built. The facilities available will determine how this may be done. The arrangement of materials may be demonstrated by the teacher or by some pupil. This may be done by using a stove or a furnace, or it may be done in the open air. Pupils should be

encouraged to repeat the project as soon as suitable opportunity is afforded and to report results.

8. This project may be used as introductory to the studies of ventilation, the heating of ovens, the preparation of fuels, such as artificial gas, coke, and charcoal, and the application of heat in industries.

Problem for Ninth-Grade Pupils

Proposal. To introduce pupils to a study of the magnitudes and interrelations of the members of the solar system.

Problem. To study the moon in its relationships to the earth and the sun.

Procedure. 1. The subject may be begun with good effect about the time of a full moon. Greater interest will be aroused if pupils keep records for a month on the phases of the moon that appear from night to night. Causes of the phases may be studied.

2. The study of the phases of the moon will lead to questions with regard to its size, physical surface, and position with reference to the earth and the sun. The use of a tellurion will be helpful in conveying to pupils the relative sizes, positions, and movements of the earth, moon, and sun.

3. For pupils living near large bodies of water the records on the phases of the moon may be checked against records made of the changes of tides.

4. A study may be made of the causes of eclipses. Pupils may wish to construct a tellurion from balls of different sizes placed at proper distances, for the purpose of demonstrating how a partial or a total eclipse is produced. Charts may be constructed showing the orbit of the earth about the sun and that of the moon about the earth.

5. Pupils may become interested in learning how it is possible to predict with accuracy when an eclipse will take place. The

relative effects of the direct and the reflected light of the sun upon the earth may be discussed.

The problem may be increased in complexity by studying what the effects would be on tides, eclipses, and day and night if the earth had more than one moon.

Observations on the science lessons outlined. The first study deals primarily with plant life; the second, with animals; the third, with the earth; the fourth, with the properties of matter, including both physical and chemical changes; the fifth, with the earth's relation to the sun and moon. Thus, different fields of nature materials have been included.

It should be noted also that the procedures suggested include all the fundamental types of teaching: observation, manipulation of natural and artificial objects, discussion, the use of different kinds of written and printed matter, application of the thinking processes to the solution of problems, and the final organization of data with the formulation of principles inherent in the natural world.

VII. CHAPTER SUMMARY

Man's intimate relationships with plants and animals forced him to study nature's laws as they are reflected in animal and vegetable life. At first he preyed upon the life about him without regard for its future; later he came to look upon the perpetuation and development of plants and animals as important factors in his own welfare.

For untold ages man looked upon the inanimate forces of nature with fear, but finally he came to understand that by making a study of natural forces he might coöperate with them and even direct them to do his work. Great bodies of knowledge dealing with different phases of the animate and inanimate worlds came to be organized. In time these systems of knowledge came to be known as astronomy, botany, geology, physics, chemistry, and zoölogy.

While the beginnings of the sciences may be traced to pre-Christian times, modern sciences date back to about the fifteenth and sixteenth centuries. The ideals of educational institutions at that time were not conducive to scientific study, and so the beginnings of the sciences were developed in the outside world. By and by the new studies were introduced into the schools: at first in higher institutions, from whence they were gradually pushed down into the lower schools, finally reaching the lowest grades.

For a long time the several phases of nature were kept apart in the schools, causing students to study different science subjects without gaining any appreciation of their interrelationships. Through the introduction of object lessons and nature study in the elementary schools, courses known as "general science" came to be popular in the middle grades. This fusion of the sciences has led to their application to the problems of everyday life, and this has popularized their study on all levels of school work.

The science studies were first introduced into the schools below college rank in the first half of the last century. The textbooks, which were college-made, contained abstract statements of natural laws but gave little attention to their application. Soon after the middle of the century short courses in the sciences, such as the Fourteen Weeks' Series, began to appear. These served as wedges for driving various phases of science work deeper into the grades.

Simple books on object lessons came into use before the middle of the nineteenth century. These were followed by the books on elementary science, which in turn gave way to books on nature study. Toward the end of the century series of nature readers made their appearance in the schools. By the close of the century the colleges were forcing laboratory manuals into the high schools.

At the beginning of the present century two different influences were directing science work in the schools: in the lower grades the nature-study materials were being more and more related to the problems of everyday life, whereas in the upper high-school grades the work was outlined in accordance with college-entrance requirements. These two influences were finally fused, with the result that textbooks in general science were prepared for the middle grades.

Thus within a century science textbooks used in the lower schools have been changed from broad outlines of concentrated knowledge to guides for the solution of common problems encountered in the world with which children are in daily contact.

In assigning nature materials to the various levels of school work, those in control have sometimes thought that different kinds rather than different grades of subject matter should be provided for children of different ages. This condition has been remedied, so that when children are taught the elementary principles of plant and animal life, the simple changes and properties of matter, the modifications of the earth's surface taking place on and about the school grounds, or the causes of the changes of seasons, they are considered students of botany, zoölogy, physics, chemistry, geology, and astronomy as much as if they were doing postgraduate work in a university. This has led to a gradation of problems to meet the maturity of pupils instead of separating the different phases of the sciences in different years. As a result, general science has made considerable headway in the middle grades.

No one set of problems will meet the needs of pupils in all parts of the country. In the lower grades the best approach to the science studies will be made through the conditions and problems prevailing in the locality of the school. The flora and fauna of arid regions will differ from those of well-watered countries. Elevation, latitude, river systems, etc. will influence the selection of the nature materials that should be used in any particular school. The phases of nature selected for study in the lower grades should be elaborated as pupils move into the higher grades. Additional and more difficult problems should be attacked as pupils increase in experience and in power of comprehension. The more specialized and concentrated forms of the sciences should be reserved for senior-high-school or college students.

Although Aristotle is said to have used the inductive method in the study of the sciences, his *Organon*, an exposition of deduction, is the only discussion of his method transmitted to posterity; and although Copernicus and other scientists of the sixteenth century used the inductive approach in their studies, it remained for Francis Bacon to formulate the principles of this type of reasoning in his *Novum Organum*, published in 1620. Another contribution to the development of scientific method was made by Linnæus, the founder of modern botany, who published his *Genera of Plants* about 1735. This work furnished the foundation for systems of classification used in the schools for a hundred and fifty years.

Textbooks of the nineteenth century reveal the addition of three types of teaching to those already in use. These were a larger use of pictures and drawings, the development of experimentation, and a more extensive use of natural objects.

The last century closed in a state of agitation with regard to the teaching of science. The lecture method, the classification method, and even the laboratory procedure had failed to popularize science studies with young people. Great industrial developments, coupled with a new psychology, along with a new demand for more practical work in the schools, brought about changes both in materials and in methods. Among the new principles proposed for teaching the sciences were means for motivating study, better selection of problems, and larger freedom for pupils in doing their work. Books, instead of controlling science studies, became merely guides for the direction of pupils while dealing with nature materials. The laboratories were extended to include natural objects in their original settings.

Science teaching within the last quarter-century has come to deal with the propagation and development of plants and animals, the understanding and application of the laws of physics and chemistry to the solution of the student's daily problems, the best ways for dealing with the earth's surface as the home of man, and the influences that the sun and moon have on the human race.

EXERCISES

1. Make a list of scientists of the seventeenth century and name an important achievement of each.

2. Explain how astronomy was developed from astrology; how chemistry was developed from alchemy.

3. Select lists of scientific discoveries that have greatly influenced each of the following institutions: the home, the school, the farm, the factory, and the store.

4. Explain why the sciences were slow in reaching the middle grades.

5. Compare the topics discussed in any one of Steele's "Fourteen Weeks" books with the topics found in a similar science book now in use.

6. Make a list of the arguments made *for* and *against* the teaching of "general science" in the schools.

7. Trace the changes in methods used in teaching the sciences within the last fifty years.

8. Explain why it is difficult to secure well-trained science teachers for the schools.

9. Make a list of the sources from which the science teacher may draw materials for use in his classes.

10. Outline a problem for eighth-grade pupils that will require knowledge of three different science subjects for its solution.

11. Suggest plans for the preparation of an adequate supply of general-science teachers.

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CHAPTER X

TOOL SUBJECTS OF ECONOMIC LIFE

I. THE DEVELOPMENT OF ECONOMIC TOOL SUBJECTS

Origins of the tool subjects. While language serves as an instrument in the establishment of many relationships, the development of economic life has called into existence certain tool subjects suited to its own particular needs. Among these mathematics stands out as the most conspicuous example.

That the different phases of mathematics, in their lower forms, may be traced to economic demands is well known to those familiar with the history of economic life. One needs but to enumerate the topics found in any general arithmetic to reach a conclusion as to their origin and uses.

Simple numbers have been in use from the dawn of civilization, but their development has come about largely in connection with the expansion of commercial and industrial life. The Greeks were not a commercial people and therefore did comparatively little in the development of numbers. On the other hand, the Romans were interested in trade, and so they worked out a comprehensive counting system which became an important subject in their elementary schools. Arithmetic in its present form, however, was not developed until economic life began to grow more complex. Then it was that decimal fractions came into use, additional tables of weights and measures were invented, and the various applications of percentage were devised to meet the needs of business transactions. Different forms of negotiable paper became necessary, systems of bookkeeping were organized, and monetary standards were established, all of which added to the subject matter of arithmetic and made it an essential tool subject of business life.

While geometry soon came to be thought of as an instrument for exercising the mind rather than as a tool for the conduct of economic life, it nevertheless had its origin in a need for measuring land and has continued to serve in that capacity until the present time. Both trigonometry and a great part of geography have been developed from geometry. Navigation, exploration, surveying, and mensuration are carried on by means of geometry or some of its specialized forms.

Algebra has sometimes been called generalized arithmetic because of its origin in that subject. Its development took place as the result of a desire to find a more economical way for ascertaining unknown quantities. In both algebra and geometry, developments in subject matter have been made beyond economic needs, but the fact remains that these subjects still contribute largely to the solution of the practical problems that arise in the material world. In the past they have been given a large place in the schools because of their supposed value as instruments for mental discipline. As a result of a new psychology and a call for functional subject matter in the schools, algebra and geometry are being revised and used again as tool subjects in the capacities for which they were originally designed. Furthermore, they are being pushed farther and farther down into the middle grades.

Bookkeeping, or the application of arithmetic in the conduct of business affairs, developed with the increase in the complexity of economic relationships until it has come to play a part in the life of the ordinary man. It also provides employment for large numbers of people whose duty it is to keep the accounts of the commercial world. Not only have elements of bookkeeping been incorporated in the arithmetics, but so-called commercial arithmetics have appeared from time to time, to say nothing of the systems of bookkeeping that have been prepared for different levels of school advancement.

While language, as has been stated, serves as a tool subject in acquiring many desirable relationships, certain written forms have been developed to meet special needs. For centuries handwriting served in the conduct of economic relationships just as in other fields; but by and by the demand for economy of time, the desire for a plainer and more uniform standard of writing, and the division of labor on the basis of abilities and interests led to the invention of stenography and typewriting. These are now looked upon as essential tool subjects in business communication.

How mathematics came into American schools. The program of studies announced for Harvard College about 1650 included no mathematics except the elements of arithmetic and geometry, and these were placed in the senior year. Yale College first made "elementary Arithmetic" an entrance requirement in 1745; Princeton required "Vulgar Arithmetic" for admission in 1760; and the Harvard entrance requirements prescribed in 1808, for the first time, that the candidate "be well instructed in the following rules of Arithmetic, namely, notation, simple and compound, Addition, Subtraction, Multiplication, and Division, together with Reduction and the single Rule of Three." [1]

The late appearance of mathematics in American colleges was doubtless a result of two conditions: the lack of development of commercial life and the absence of a desire on the part of the colleges to take any part in the preparation of their students for participation in economic affairs.

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[1] E. C. Broome, *A Historical and Critical Discussion of College Entrance Requirements*, p. 42. The Macmillan Company, 1903.

With the founding of the "academy" in America near the middle of the eighteenth century, such subjects as arithmetic, merchants' accounts, geometry, navigation, and surveying appeared in the program of studies. This was a result of the growth in commercial and industrial interests, the extension of settlements, and the growing belief that the schools should prepare pupils not only for the learned professions but also for the practical needs of daily life. It was for the purpose of meeting the demands for more useful subjects that a new type of school was organized.

The program of studies of Phillips Exeter Academy [1] in 1808 called for arithmetic and algebra through simple equations in the first year; geometry, plane trigonometry and its applications to heights and distances, and the mensuration of surfaces and solids in the second year; and surveying and navigation in the third year. This was the work outlined for the "English Department"; in the "Classical Department" the first two years were given to arithmetic, and algebra and geometry were assigned to the third year.

The same influences that carried mathematics into the academies led to the introduction of arithmetic into the elementary schools. Indeed, two schools often appeared side by side, the one for teaching reading and the other for teaching writing and arithmetic. Thus it may be seen that arithmetic passed from the senior year in college, first to be a college-entrance requirement and then to become one of the principal subjects in the elementary schools attended by pupils from six to fourteen years of age. In the same way the elementary phases of algebra, geometry, and trigonometry have been pushed down step by step until they are now considered appropriate subjects of instruction for boys and girls in the junior-high-school grades.

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[1] E. E. Brown, *The Making of our Middle Schools*, pp. 237–239.

Early textbooks in elementary mathematics. As early as 820 Rabanus Maurus wrote a book entitled *On Reckoning* that had much to say on the properties of numbers. This seems to have been a discussion of the Roman system of using different parts of the hands, arms, and body for counting. It also pointed out the Scriptural significance of numbers. Gerbert (who became Pope Sylvester II) invented an abacus about the close of the tenth century, but little real progress was made in the development of subject matter in arithmetic until the sixteenth and seventeenth centuries.

Cubberley states that an arithmetic was published in England about 1540, but that the first book to attain popularity was *Cocker's Arithmetic*, published in 1677. In accordance with a common practice found in early textbooks, the simple title of Cocker's book is qualified by the phrase, "Being a Plain and Familiar Method suitable to the Meanest capacity, for the understanding of that incomparable Art."

As with all other subjects in colonial times, the first textbooks used in America were published in England. Cubberley[1] writes:

> The first book [arithmetic] written by an American author was Greenwood's *Arithmetick, Vulgar and Decimal*, which appeared in Boston, in 1729. In 1743 appeared Dilworth's *The Schoolmaster's Assistant*, a book which retained its popularity in both England and America until after the beginning of the nineteenth century.

The most popular of all the early books on mathematics seems to have been Warren Colburn's *First Lessons in Intellectual Arithmetic*, first published in 1821. This book was used in the schools through a period of seventy-five years. Its service to the public has been compared to that of Webster's speller, and the most extravagant eulogies upon it appeared from time to time. In Barnard's *Journal of Education*, Vol. II (1856), p. 302, may be found the following statement:

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[1] E. P. Cubberley, *History of Education*, p. 444. Reprinted by permission of Houghton Mifflin Company, Publishers.

> Thus the *First Lessons* worked its way gradually to notice and favor, — a book which has enjoyed a more enviable success than any other school-book ever published in this country, and the merits of which are now universally acknowledged to be equal to its success. It has been said to be the only faultless school-book that we have. It has certainly wrought a great change in the manner of teaching arithmetic.

The great merits of this book seem to consist in the use of mental rather than written exercises, in a careful selection and arrangement of problems, and in the application of the so-called inductive procedure in teaching. Colburn also published an *Algebra upon the Inductive Method*, in 1825.

By the middle of the nineteenth century textbooks on mathematics were becoming more numerous. Among others the series prepared and published as "Ray's Mathematics" became very popular. This series embraced the following titles: *Primary Arithmetic*, *Intellectual Arithmetic*, *Practical Arithmetic*, *Higher Arithmetic*, *Elementary Algebra*, *Higher Algebra*, and keys to the last four books named. In the same series there were books on geometry, trigonometry, astronomy, surveying and navigation, and calculus. Thus it may be seen that by 1850 books on mathematics became available for all classes from the primary grades to the colleges.

Subject matter in the nineteenth-century arithmetics. Although elementary mathematics, as already stated, had its origin in commercial and economic needs, it later became a subject for mental drill. This led to the expansion of subject matter beyond the domain of practical application. As a result of this development, textbooks became loaded with abstract and dead materials.

In no other phase of mathematics was the use of effete materials more prevalent than in arithmetic. In the first place, topics were included whose practical application belonged to earlier periods of commercial or economic life. Certain tables in denominate numbers, different ways for computing interest, equation of payments, and the evaluation of moneys and measures in terms of different countries were useful when they were originated; but with the organization of national banks, the standardization of weights and measures, and the development of shorter methods, much of the subject matter of the textbooks became obsolete.

Again, the forms in which the materials were presented, we now believe, are subject to just criticism. That the books presented in the lower and middle grades contained numbers far beyond the realm of practical application, problems too involved for the comprehension of the pupils for whom they were intended and that were suited only to the needs of a comparatively few advanced pupils, constitute a few of the indictments brought against the arithmetics of the last century.

Changes in mathematics textbooks within the last twenty-five years. One of the most difficult tasks that confronted textbook writers was the preparation of subject matter in algebra that could be put into the seventh and eighth grades. G. A. Wentworth published his *First Steps in Algebra* in 1894. In the preface we read, "This book is written for pupils in the upper grades of the grammar schools and the lower grades of the high school." Within the next fifteen years other elementary textbooks in algebra, designed for use in the seventh and eighth grades, appeared. These were largely mere simplifications of higher books, and made little attempt to apply the principles of algebra to practical problems. An exception, however, to this practice may be found in a book entitled

Vocational Algebra,[1] published in 1911. In the preface appears the following statement:

> The time has arrived when algebraic language has such a well-defined place in trade journals, artisans' manuals, and handbooks of business, that the workman in the shop and the business man in the office have each a practical need to interpret it. The growth of industrial and commercial classes, one of the most significant features of our present work in education, helps to create such a need, and the shop itself is not far behind the school in making it known.

Although *Vocational Algebra* appears as a separate book, the authors suggest that "for pupils using Book III of the authors' arithmetics this work is unnecessary, since it is substantially included in that text." Here we have the reappearance of algebra in the form of service, for which it was originally intended, but from which it had been largely diverted for so-called disciplinary ends.

In the transitional period between the time of complete separation of arithmetic, algebra, geometry, and trigonometry in entirely different texts and the appearance of series of books presenting "unified mathematics," attempts were made to place the applications of different phases of mathematics in special textbooks. *Mental Arithmetic*, *Oral Algebra*, *Chemical Arithmetic*, *Rural Arithmetic*, and *Farm-Business Arithmetic* are some of the titles used by different authors. Although the attempt to place the applied side of mathematics in separate textbooks was in accord with the recommendation of the Committee of Fifteen, the movement did not meet the needs of pupils in the middle grades, nor did it accord with the new psychology which was constantly pressing for a more vital motivation of school work. This new psychology, coupled with an increasing demand for a more practical training for economic and industrial occupations, compelled a union of all worthy phases of mathematics into unified systems filled with practical problems, and finally led to the production of the modern series of textbooks in mathematics now available for use in the middle grades.

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[1] George Wentworth and D. E. Smith, *Vocational Algebra*, p. iii. Ginn and Company, Publishers.

II. DISTRIBUTION OF MATHEMATICS THROUGH THE GRADES

Committee recommendations. In 1893 the Committee of Ten suggested that arithmetic be studied through the eight elementary school grades, with the addition of one lesson each week in concrete geometry, and that algebra be taken up in the ninth school year. Two years later the Committee of Fifteen recommended that a modified form of algebra be substituted for the advanced arithmetic in Grades 7 and 8.

The Committee on College Entrance Requirements in 1899 reported:

> We recommend that the course in arithmetic required of all students be limited, roughly speaking, to the following topics: the four fundamental operations for integers, and common and decimal fractions; the most important weights and measures; percentage and its applications to simple interest; and that it be completed in the sixth grade.[1]

This committee further recommended that concrete geometry, introductory demonstrative geometry, and algebra be given in the seventh grade, introductory demonstrative geometry and algebra in the eighth grade, and algebra and geometry in the ninth grade.

The National Committee on Mathematical Requirements, organized in 1916 under the auspices of the Mathematical Association of America, stated in 1921 and repeated in 1923: "It is assumed that at the end of the sixth school year the pupil will be able to perform with accuracy and a fair degree of speed the fundamental operations with integers and with common and decimal fractions." The committee outlined certain materials but refused to present a detailed syllabus, on the ground that "no one knows what is the best order of topics nor how much time should be devoted to each in an ideal course. The Committee feels that its recommendations should be so formulated as to give every encouragement to further experimentation rather than to restrict the teacher's freedom by a standardized syllabus." The following alternate plans were then suggested for the distribution of work through the seventh, eighth, and ninth grades.[1]

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[1] Report of the Committee on College Entrance Requirements, p. 21. National Education Association, 1899.

PLAN A

First year. Applications of arithmetic, particularly in such lines as relate to the home, to thrift, and to various school subjects; intuitive geometry.

Second year. Algebra; applied arithmetic, particularly in such lines as relate to commercial, industrial, and social needs.

Third year. Algebra, trigonometry, demonstrative geometry.

By this plan the demonstrative geometry is introduced in the third year, and arithmetic is practically completed in the second year.

PLAN B

First year. Applied arithmetic (as in Plan A), intuitive geometry.

Second year. Algebra, intuitive geometry, trigonometry.

Third year. Applied arithmetic, algebra, trigonometry, demonstrative geometry.

By this plan trigonometry is taken up in two years, and the arithmetic is transferred from the second to the third year.

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[1] *The Reorganization of Mathematics in Secondary Education*, pp. 29–30. The Mathematical Association of America, 1923.

PLAN C

First year. Applied arithmetic (as in Plan A), intuitive geometry, algebra.

Second year. Algebra, intuitive geometry.

Third year. Trigonometry, demonstrative geometry, applied arithmetic.

By this plan algebra is confined chiefly to the first two years.

PLAN D

First year. Applied arithmetic (as in Plan A), intuitive geometry.

Second year. Intuitive geometry, algebra.

Third year. Algebra, trigonometry, applied arithmetic.

By this plan demonstrative geometry is omitted entirely.

PLAN E

First year. Intuitive geometry, simple formulas, elementary principles of statistics, arithmetic (as in Plan A).

Second year. Intuitive geometry, algebra, arithmetic.

Third year. Geometry, numerical trigonometry, arithmetic.

III. OUTLINE OF MATHEMATICS MATERIALS

Materials in the fourth, fifth, and sixth grades. A committee representing the leading cities of southern California undertook to ascertain from people in different walks of life the minimum essentials of arithmetic. After canvassing the returns they made the following list:

1. Addition of five addends, five digits wide.
2. Subtraction, five digits wide.
3. Multiplication, with a multiplicand of five digits and a multiplier of four digits.
4. Division, with a dividend of five digits and a divisor of four digits.
5. Addition, subtraction, multiplication, of the following fractions: halves, thirds, fourths, fifths, eighths, and tenths.

6. Decimal fractions of three places.
7. Simple interest.
8. Cash accounts and children's and family expense accounts.
9. Cash, checks, and bills.
10. Banking.

Although not included in the list, provision is made for teaching the common forms of denominate numbers. Work in the fundamental processes is to be continued in the fourth grade. A divisor with two digits is to be introduced. Drill on the fundamental processes and common fractions are proposed for the fifth grade, and decimal fractions and the elements of percentage are suggested for the work of the sixth grade. Simple forms of denominate numbers are assigned to each grade. It should be observed that the work outlined is proposed as the minimum essentials and that many schools will go beyond the amount set down. It is suggested that the work is to be motivated by the constant use of projects and problems encountered in daily experiences.

Materials in the seventh, eighth, and ninth grades. Without attempting to assign the work to specific grades, the National Committee on Mathematical Requirements[1] suggests the following materials for the three junior-high-school grades:

ARITHMETIC

1. Tables of weights and measures in general practical use.
2. Simple fractions.
3. Fundamental operations.
4. Short cuts in multiplication and division.
5. Percentage.
6. Use of line, bar, and circle graphs.
7. Arithmetic of the home.
8. Arithmetic of the community.

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[1] *The Reorganization of Mathematics in Secondary Education*, pp. 21–25. The Mathematical Association of America, 1923.

9. Arithmetic of banking.
10. Arithmetic of investment.
11. Statistics as used in tables, graphs, pictograms, and frequency distributions.

The work outlined in many instances is a continuation of processes begun in the lower grades.

INTUITIVE GEOMETRY

1. Measurement of distances and angles by scales and protractors.
2. Calculation of areas of common surfaces and solids.
3. Drill in numerical computation of figures.
4. Measurements by drawings or scales. Use of ruled paper.
5. Appreciation of geometric forms in nature, architecture, manufacture, and industry.
6. Use of ruler and compasses in geometric constructions.
7. Study of the triangle.
8. "Informal introduction to the idea of similarity."

ALGEBRA

1. The formula — its construction, meaning, and use.
2. Graphs — their construction and interpretation.
3. Positive and negative numbers — meaning and use.
4. The equation — its use in solving different types of problems.
5. Algebraic technique in fundamental operations, factoring, fractions, exponents and radicals, and checking results.

NUMERICAL TRIGONOMETRY

1. Definitions of the functions — sine, cosine, and tangent.
2. Properties and use of functions.
3. Problems involving the right triangle.
4. Use of tables of functions to three or four places.

DEMONSTRATIVE GEOMETRY

1. A limited number of propositions to show what "demonstration" means.

The foregoing is a condensed outline of the materials in mathematics proposed by the committee, to be completed by the end of the last year of the junior high school. So many textbooks are now available for teaching junior-high-school mathematics that it does not seem necessary to outline the subject matter in greater detail in this connection.

IV. METHODS USED IN TEACHING ELEMENTARY MATHEMATICS

Early procedures. Although Greenwood's arithmetic was available for use in American schools as early as 1729 and Dilworth's *Schoolmaster's Assistant* appeared in 1743, textbooks were not regularly placed in the hands of pupils until a much later date. The writing master usually taught the arithmetic. Pupils were required to copy into their own notebooks rules furnished by the teacher. In the solution of problems little attempt was made to develop reasoning or thought processes. The pupils were expected to learn to apply the rules by working over, after the teacher, certain series of examples or problems. Nor was there much attempt to connect the work with the solution of concrete problems.

Before the end of the eighteenth century Pestalozzi, whose writings greatly influenced the teaching of arithmetic, complained that children were taught the names of numbers but not their meanings. Pestalozzi's ideas were later accepted by Warren Colburn, who worked them out in his *First Lessons in Intellectual Arithmetic*, probably the most influential book on methods in mathematics published in America in the nineteenth century.

Colburn's methods are outlined in the prefaces to his *First Lessons* (1821) and in his *Algebra upon the Inductive Method of*

Instruction (1825). In the arithmetic he condemns the prevailing practice in the following terms:

> The usual mode of proceeding is as follows: The pupil learns a rule, which, to the man that made it, was a general principle; but with respect to *him*, and ofttimes to the instructor himself, it is so far from it, that it hardly deserves to be called even a mechanical principle. He performs the examples, and makes the answers agree with those in the book, and so presumes they are right. He is next to apply his rule to practical examples; but if he did not find the examples under the rule, he would never so much as mistrust they belonged to it.

He then presents his own plan as follows:

> We first make calculations about sensible objects; and we soon observe that the same calculations will apply to things very dissimilar; and finally, that they may be made without reference to any particular things. Hence, from particulars, we establish general principles, which serve as the basis of our reasonings, and enable us to proceed, step by step, from the simple to the more complex operations. It appears, therefore, that mathematical reasoning proceeds as much upon the principle of analytic induction, as that of any other science.

His method is further outlined in the preface to his algebra:

> The best mode, therefore, seems to be to give examples so simple as to require little or no explanation, and let the learner reason for himself, taking care to make them more difficult as he proceeds.

Thus in Colburn's books, published a century ago, we find methods proposed that are in entire accord with the psychology of the present day. The use of objects, the "inductive" approach, the employment of practical problems, procedure from the simple to the complex, insistence upon understanding before memory, the precedence of mental work over written work, and the demand for personal responsibility of pupils in the original solution of problems — all of which Colburn seems to have advocated — are now accepted as correct principles of teaching. Colburn's books probably led to a larger use of mental arithmetic by the middle of the last century; and many later textbooks in elementary mathematics claimed to follow the inductive procedure although they were actually constructed on the basis of deductive teaching.

A procedure known as the "spiral system" somewhat influenced the teaching of elementary mathematics in the last century. According to this plan different principles were taken up and treated in a partial or elementary form and then brought up from time to time for further consideration. This method did not prove altogether popular; so in the preface to a rather widely used series of arithmetics about the beginning of the present century we find the statement, "No attempt has been made to follow the so-called 'spiral system,' now decadent." However, it cannot be said that certain elements of the "spiral system" have not come to be used in the "unified mathematics" of the present day.

Psychologists and the teaching of mathematics. For a time, as already indicated, mathematics was taught as a "deductive science." Rules or principles were first committed to memory; then an attempt was made to apply them to the solution of individual problems.

Herbart and his disciples developed what came to be known as the "five formal steps": preparation, presentation, comparison and observation, generalization, and application. For a time these steps were looked upon as constituting the essential procedure in all inductive teaching. Soon it was proposed that this procedure should be applied to the teaching of mathematics as well as to other subjects in the elementary field; hence there began to appear many textbooks claiming to be organized in accordance with the "formal steps."

However, it remained for Professor John Dewey to add a significant contribution to the clarification of the use of induction and deduction in teaching. Professor Dewey set forth the idea that induction and deduction are likely to be closely blended in the teaching process. In the first place, the fifth step in the Herbartian procedure is nothing more nor less than the process of deduction, or the application of the principles derived to the solution of individual problems. The more recent textbooks in elementary mathematics propose to begin with individual cases, develop a principle, and then apply the principle to new cases, or to use both induction and deduction as the two sides of a single process.

A further modification of procedure in teaching elementary mathematics has been proposed by Professor E. L. Thorndike in his series of arithmetics published in 1917. In the preface he says:[1]

> These books apply the principles discovered by the psychology of learning, by experimental education, and by the observation of successful practice, to the teaching of arithmetic. Consequently they differ from past practice in the following respects [statements condensed]:
>
> 1. Nothing included for mental gymnastics. Training obtained through content of intrinsic value.
> 2. Preparation given for problems of life and not problems of examination papers.
> 3. Reasoning treated not as a mythical faculty but as coöperation, organization and management of habits.
> 4. Interest is secured not in pictures, athletic records, and the like, but in arithmetic itself and its desirable applications.
> 5. Nothing necessary to be omitted because it is hard.
> 6. Useful habits not left to chance results of indiscriminate drill and review. Other things being equal, no habit is formed that must be later broken; two or three habits are not formed where one will do as well.

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[1] E. L. Thorndike, *Arithmetic, Book One*, *Arithmetic, Book Two*, and *Arithmetic, Book Three*. Reprinted by permission of Rand McNally & Company, Publishers.

Professor Thorndike's arithmetics represent a direct attempt to apply modern psychology to the teaching of mathematics. Among the more recent series of arithmetics that reflect the psychological and practical approach the *Searchlight Arithmetics*,[1] by Buckingham and Osburn, may be mentioned as good examples.

Essentials of modern methods in teaching elementary mathematics. Present-day theory demands first that mathematics in the middle grades shall deal with materials derived primarily from the economic relationships of practical experience. In the second place, the methods used in teaching must conform to the theory of mind development as promulgated by modern psychology. While certain mental discipline may be a result of mathematical study, that is not the primary object. Fundamental principles in problem-solving are to be mastered; but mastery is to be attained by means of thought processes inherent in the problems solved and not through mere memory exercises.

In the solution of problems the different phases of mathematics, such as arithmetic, algebra, and geometry, are to be considered merely as tools that may be employed, in their elementary forms, in all junior-high-school grades. Instead of the teacher's doing the work for pupils, as was formerly the practice, responsibility for advancement is now placed upon the learner, with the teacher merely providing encouragement and guidance.

It is now held in some places that the use of objects, the employment of measuring rods, the introduction of actual commercial paper, and the computation of real accounts have changed elementary mathematics in the middle grades from a despised subject to one of the most popular in the entire program of studies.

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[1] *The Buckingham-Osburn Searchlight Arithmetics.* Ginn and Company, 1927.

V. OTHER ECONOMIC TOOL SUBJECTS

Bookkeeping in the schools. When the High-School Society of New York opened its first school for girls in 1826, it made bookkeeping a required subject for all pupils. In the same year Massachusetts enacted a statute requiring every town of five hundred families or more to provide a schoolmaster able to give instruction in United States history, *bookkeeping*, surveying, and algebra.

Although bookkeeping has been taught in the schools for more than a hundred years, special training for commercial occupations was for a long time given largely in private "business colleges"; but with the great development of public high schools in the latter part of the last century, commercial curricula were regularly incorporated in the program of studies.

The Commission on the Reorganization of Secondary Education, in *United States Bureau of Education Bulletin No. 55* (1919), calls attention to the fact that with the organization of the junior high school has come a tendency to push technical training for business life down into the seventh, eighth, and ninth grades. This movement is deplored by the Commission. The subcommittee calls attention to the fact that changes in methods of bookkeeping have lessened the demand for old-time bookkeepers. It recommends that "elementary bookkeeping, business forms, and business writing" be given in the ninth grade.

In preparing the program of studies for the middle grades the training of professional bookkeepers should not be considered a primary object, but the instruction of all pupils in simple forms for keeping personal and domestic accounts should be made a consideration of the highest importance. This is now cared for, in a measure, as a part of the work in mathematics; but pupils should be given a chance, in a general or exploratory course, to become acquainted with the fundamental principles of bookkeeping before they leave the middle grades.

Typewriting and stenography. The rapid rate at which typewriting has been substituted for handwriting has led some experts on the teaching of the latter to suggest that a much lower standard of efficiency may properly be accepted in the schools than was formerly exacted.

Instead of giving an undue amount of time in an effort to secure a high standard of efficiency in handwriting, it is proposed to give pupils a chance to learn the elementary principles used in the manipulation of a typewriter. This may be undertaken in any one of the junior-high-school grades, the time to be determined in accordance with the locality, the size of the school, and the daily program.

Stenography is a more specialized tool than typewriting. Its efficient use will depend upon a command of the vernacular. Indeed, stenography is merely an abbreviated form of writing. Since it will be used by only a small percentage of people in practical life, it is not generally recommended as a subject especially suited to the needs of pupils in the middle grades.

Specialized courses. Such terms as "business English," "business or commercial arithmetic," "commercial geography," and "business letter-writing" have long been used in connection with preparation for participation in commercial life. In the past these terms were used as representing something different from ordinary English, arithmetic, and geography, as, indeed, they did. Today an attempt is being made to teach the principles underlying the tool subjects by means of applications to life conditions. Therefore it would be better to speak of special courses in English, arithmetic, geography, rather than special subjects in commercial courses. Then whatever work is undertaken in the middle grades for preparation for present or future participation in economic life may be looked upon as further study along lines already begun in the lower grades.

VI. UNITS OF WORK IN MATHEMATICS

Arithmetic in the Fifth Grade

Ultimate aim. To lead pupils to use speedily and accurately the steps involved in the addition of common fractions.

Immediate aim. To assist pupils in learning the steps required in the addition of mixed numbers.

Problem. The school cafeteria provides ice cream for the pupils. In one week the following amounts were consumed: Monday, $3\frac{2}{3}$ gallons; Tuesday, $3\frac{3}{4}$ gallons; Wednesday, $4\frac{1}{6}$ gallons; Thursday, $3\frac{5}{12}$ gallons; Friday, $4\frac{1}{2}$ gallons. The following week the amounts sold were as follows: Monday, $3\frac{3}{8}$ gallons; Tuesday, $4\frac{1}{4}$ gallons; Wednesday, $3\frac{3}{4}$ gallons; Thursday, $4\frac{1}{2}$ gallons; Friday, $3\frac{3}{16}$ gallons. The manager of the cafeteria has requested the class to tell her how much ice cream was used each week and how much was used in the two weeks.

Procedure. 1. It is assumed that pupils in the lower grades have already learned to add such fractions as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{5}$, etc. They have also learned to change $\frac{1}{2}$ to $\frac{2}{4}$, to $\frac{4}{8}$, etc., and to change $\frac{5}{10}$ to $\frac{1}{2}$, and $\frac{4}{8}$ to $\frac{2}{4}$ or $\frac{1}{2}$, etc.

2. Questions may lead the pupils to conclude that it will be best to add the whole numbers and the fractions separately and then combine the results.

3. To find the amount consumed the first week:

a. $3 + 3 + 4 + 3 + 4 = 17$ gallons.
b. $\frac{2}{3} + \frac{3}{4} + \frac{1}{6} + \frac{8}{12} + \frac{1}{2} = ?$ gallons.

Questions may lead to the conclusion that things with different names, such as cows, horses, and sheep, cannot be added together. From this it may be concluded that since the fractions have different names, such as thirds, fourths, etc., they cannot be added until they are changed to the same name or size of unit. The next step will then be to change all the fractions to the same units, thus:

c. $\frac{2}{3} = \frac{8}{12}$; $\frac{3}{4} = \frac{9}{12}$; $\frac{1}{6} = \frac{2}{12}$; $\frac{8}{12} = \frac{8}{12}$; $\frac{1}{2} = \frac{6}{12}$.
d. We may now write $\frac{8}{12} + \frac{9}{12} + \frac{2}{12} + \frac{8}{12} + \frac{6}{12} = ?$
e. Performing the addition, we get $\frac{33}{12} = 2\frac{9}{12} = 2\frac{3}{4}$.
f. Adding the sum of the whole numbers and the sum of the fractions, we get $17 + 2\frac{3}{4} = 19\frac{3}{4}$ gallons.

4. In a similar manner pupils may be guided to find how much ice cream was consumed during the second week. The pupils may then be requested to find the amount used in both weeks. In order to provide practice in performing the steps, the figures for the days of the week may be changed. This may be continued until the pupils can perform the operations with considerable facility. Rivalry will often increase interest in manipulation of the steps.

5. When pupils are able to perform the operations with some degree of facility, a number of solutions may be placed on the board. The pupils may, with the guidance of the teacher, compare the steps taken in the different cases, and may reach the conclusions that fractions to be added must be changed to the same unit or denominator, and that the numerators may then be added and the result placed over the common denominator. Some prefer to speak of the "number above the line" and the "number below the line" instead of using the terms "numerator" and "denominator"; but to the author there seems to be little reason for withholding these terms from pupils in the fifth grade.

The principles developed may now be formulated and committed for use in the solution of future problems.

Mathematics in the Seventh Grade

Ultimate aim. To prepare pupils to use different phases of mathematics in the solution of practical problems of daily life.

Immediate aims. To take measurements, to study the names and relations of lines and angles involved, to make arithmetical calculations, and to make a formula for determining the contents of rectangular solids.

Materials needed. (1) Rectangular boxes of different sizes; (2) measuring sticks or tapes; (3) a try square for determining right angles; (4) blackboard, pencils, and paper.

Problem. As suggested in the immediate aims, the problem will involve three different phases of mathematics: concrete geometry, arithmetic, and the construction and use of an algebraic formula. The completion of the work will require several lessons.

Procedure A. Concrete geometry of rectangular solids. 1. Permit pupils to measure the boundary lines — length, width, and height — of the boxes provided.

2. Examine the angles formed by the ends with the sides, by the ends with the bottoms, by the sides with the bottoms.

3. Lead to discussions of meanings and relationships of perpendicular lines and right angles. Use proper instruments for determining perpendicular lines and right angles. Locate different illustrations about the room. After the measurements are made and meanings and relationships are discussed, definitions of parallel lines, perpendicular lines, right angles, and rectangular solids may be formulated.

Procedure B. Arithmetic of rectangular solids. 1. Permit pupils to measure any rectangular solids at home or at school that they may select. Small or large boxes, coal bins, wagon beds, box cars, storerooms, etc. may be mentioned as objects that may furnish need for the calculation of solid contents.

2. It will be best at first to direct all members of the class to the manipulation of a single set of measurements. The procedure may include the following steps: (1) take accurate measurements; (2) calculate the area of the bottom, and the resulting cubic contents of a layer one unit high; (3) multiply this number by the total units in the height of the box.

3. Drawings on the board will be of great value in the procedure. Drawings may then be erased from the board, and pupils may be allowed to illustrate the steps with drawings on paper.

4. Practice should be continued with real or imaginary boxes until success in calculations is attained.

5. The general principles for finding the contents of rectangular solids may now be formulated by the class, and application of the principles may be continued from time to time until they are thoroughly learned.

Procedure C. *Algebraic formula for finding the contents of rectangular solids.* 1. The arithmetical principles may now be reduced to an algebraic formula by substituting letters and signs for words.

In the arithmetical rule that length multiplied by width multiplied by height equals solid contents, we may substitute l for length, the sign × for multiplied by, w for width, h for height, and the sign = for equals. The formula then becomes $l \times w \times h =$ contents of a rectangular solid.

2. Pupils may now be allowed to secure measurements of rectangular solids, to find the contents (using the algebraic formula), and to turn in their work for inspection and verification. Pupils should be encouraged to locate actual problems connected with the home, store, or farm.

Elementary Accounting

Ultimate aim. To prepare pupils for keeping simple accounts.

Immediate aim. To study illustrations of simple impersonal and personal accounts.

Problem A. An impersonal account. Henry and James planted a garden. Their expenses were as follows: April 1, plowing, $1; April 10, tools, $1.25; April 15, seed, 40¢; May 1, plants, 50¢. On May 25 they sold onions for 60¢, lettuce for 45¢, and radishes for 30¢; on June 15, peas for 80¢ and beans for 60¢; on July 1, beans for 75¢ and corn for 60¢; on August 1, tomatoes for 65¢, corn for 80¢, and beans for 85¢.

A CORRECT STATEMENT OF THEIR BUSINESS

Garden Account

Dr.				Cr.			
April 1	Plowing	1	00	May 25	Onions		60
10	Tools	1	25	25	Lettuce		45
15	Seed		40	25	Radishes		30
May 1	Plants		50	June 15	Peas		80
				15	Beans		60
				July 1	Beans		75
				1	Corn		60
				Aug. 1	Tomatoes		65
				1	Corn		80
	Balance (red)	3	25	1	Beans		85
		6	40			6	40
					Balance	3	25

Problem B. Store account. Mr. Virgil Agrarian's account at the store for the month of September included the following entries: Sept. 1, bought 2 pairs of shoes @ $4 a pair; Sept. 5, sold 6 doz. eggs @ 35¢ per doz. and 20 lb. butter @ 40¢ per lb.; Sept. 10, bought 8 yd. dress goods @ 75¢ per yd.; Sept. 10, bought groceries, $4.50; Sept. 15, sold 30 bu. corn @ 80¢ per bu.; Sept. 15, bought clothing, $14; Sept. 20, sold 10 doz. eggs @ 35¢ per doz. and 18 lb. butter @ 40¢ per lb.; Sept. 25, bought groceries, $4.25; Sept. 30, sold 20 bu. wheat @ $1.40 per bu.; Sept. 30, bought stove, $15.

Statement of Account with Balance for the Month

Virgil Agrarian

Dr.				Cr.			
Sept. 1	2 pr. shoes @ $4 a pair	8	00	Sept. 5	6 doz. eggs @ 35¢	2	10
10	8 yd. goods @ 75¢ a yd.	6	00	5	20 lb. butter @ 40¢	8	00
10	Groceries	4	50	15	30 bu. corn @ 80¢	24	00
15	Clothing	14	00	20	10 doz. eggs @ 35¢	3	50
25	Groceries	4	25	20	18 lb. butter @ 40¢	7	20
30	Stove	15	00	30	20 bu. wheat @ $1.40	28	00
	Balance (red)	21	05				
		72	80			72	80
				Sept. 30	Balance	21	05

Procedure. 1. The two accounts just submitted are presented merely as specimens. The work may be motivated by dealing with figures secured from the cafeteria, the dramatic club, the athletic association, a garden club, or some other school or home enterprise. Specimens of well-kept accounts may be examined. Debits, credits, balances, and so on may be pointed out and discussed.

2. After the examination of blanks, accounts, and the like, items of simple accounts may be placed on the board and pupils may be allowed to select the debits and credits.

3. Forms for keeping accounts should next receive attention. Pupils may be allowed to prepare outline blanks. Neatness and accuracy should be stressed.

4. A concrete problem may now be proposed. In the beginning, before entries are made, it will be best for the class to go over the proposed account together, item by item. After this other items may be submitted for individual work. Finally, pupils should be encouraged to keep personal accounts or to secure from parents items of household or small-business accounts for practice.

VII. CHAPTER SUMMARY

While language is a common tool used in the establishment of many relationships, economic life has called into existence certain special tool subjects adapted to its own particular needs. Of these special tool subjects, mathematics may be named as possibly the best example.

Mathematics, although originating largely in the economic field, in common with language, renders large service as a tool subject in the establishment of other important relationships. The special tool subjects of economic life are arithmetic, algebra, geometry, trigonometry, stenography, typewriting, bookkeeping, and commercial forms. The elements of these subjects are now thought to be proper subject materials for boys and girls in the middle grades.

Elementary mathematics came into the middle grades from both the top and the bottom of the school system. In an early program of studies of Harvard College, arithmetic was placed in the senior year; but we find also that the writing master in the early elementary schools was called upon to teach arithmetic. By the middle of the eighteenth century the colleges were beginning to specify the elements of arithmetic as an admission requirement. With the founding of the academies, mathematics became a major subject. Finally, the mathematics in the academies and the mathematics in the elementary schools became fused into the mathematics of the high schools.

Although treatises on elementary mathematics began to appear as early as the ninth century, no textbooks of consequence were written until after the Revival of Learning. Among the early arithmetics for beginners published in America was Warren Colburn's *First Lessons*. This book greatly influenced the teaching of elementary mathematics in this country. By 1850, books were available for teaching mathematics on all school levels.

As a result of a new psychology, of the great development in commercial and industrial life, and of an increasing demand for more practical materials, a complete reorganization of mathematical materials and methods for the middle grades has taken place within the last twenty-five years. This has resulted in the production of series of textbooks including elements of arithmetic, algebra, geometry, and trigonometry, designed especially for pupils in the middle grades.

Among the influences that have contributed to the redistribution of mathematics through the grades, certain committee reports have played a conspicuous part. The Committee of Ten, in 1893, suggested that arithmetic, with a limited amount of concrete geometry, be given in the first eight grades, and that algebra be taken up in the ninth grade; the Committee of Fifteen, in 1895, proposed that the elements of algebra be substituted for arithmetic in grades seven and eight; the Committee on College Entrance Requirements, in 1899, recommended that arithmetic be completed in the sixth grade, that concrete geometry, elements of demonstrative geometry and algebra be taught in the seventh grade, and that demonstrative geometry and algebra be assigned to the eighth and ninth grades; and the National Committee on Mathematical Requirements, in 1921, outlined materials to be studied in the different grades and then set up five alternative plans for the distribution of the work.

Along with the development of materials in mathematics, came significant changes in methods of teaching. At first, and for a considerable time, textbooks were not placed in the hands of the pupils. Rules to be copied by the pupils were submitted by the teachers. Much of the work had little to do with the reasoning processes. Pestalozzi complained that pupils were taught the names of numbers but not their meanings. Colburn worked out Pestalozzi's ideas in his *First Lessons*; Herbart made a contribution by laying the foundations for the "five formal steps"; Dewey showed that induction and deduction are complementary parts of one process; and Thorndike severely criticized old methods and applied the principles of modern psychology to the solution of practical problems.

Modern methods used in teaching elementary mathematics include (1) the use of materials from current life, (2) the application of the principles of modern psychology, (3) the constant employment of the thought processes, (4) the recognition of the different phases of mathematics as tools and not as ends in themselves, (5) the shifting of responsibility for the solution of problems from the teacher to the pupil, and (6) the use of both induction and deduction in the complete process of teaching mathematical principles.

Bookkeeping is an important tool subject in economic life; and although modern methods in business affairs make necessary a relatively smaller number of professional bookkeepers, every normal person will have need of the elements of accounting.

Typewriting has to a great extent supplanted handwriting in commercial communications. For this reason leading authorities recommend that pupils learn how to use the typewriter instead of striving to attain an extraordinarily high standard in penmanship.

Stenography is a tool subject of great importance; but since it rests upon a good command of language, and since few will practice it, its postponement to the senior high school is generally recommended.

EXERCISES

1. Make a study of the Romans' use of the hands, arms, and parts of the body in counting.

2. Secure a copy of an arithmetic published fifty years or more ago and compare its contents with the contents of an arithmetic in use today.

3. Make a list of changes in commercial and economic life that have called for a modification of subject matter in mathematics.

4. Select any two lines of business (for example, farming, merchandising, or banking) and ascertain the kinds and amounts of mathematics used in each.

5. Study the effects of the new psychology upon methods of teaching elementary mathematics.

6. Show that bookkeeping is a form of applied mathematics and that stenography is merely an abbreviated form of writing.

7. Formulate and solve a problem in which a principle of arithmetic is developed by means of induction, and then apply the principle developed to the solution of a specific example by means of deduction.

8. Use arithmetic, algebra, geometry, and trigonometry in the same solution or in different solutions of a single problem.

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A valuable reference.

Textbooks on "general," "unified," or "junior-high-school" mathematics have been prepared and published by the following authors and companies: E. H. Barker, Allyn and Bacon; E. R. Breslich, the University of Chicago Press; J. A. Drushel and J. W. Withers, Lyons and Carnahan; M. Gugle, Gregg Publishing Company; W. W. Hart, D. C. Heath & Co.; T. Lindquist, Charles Scribner's Sons; R. Schorling and W. D. Reeve, Ginn and Company; J. C. Stone, Sanborn; E. H. Taylor and F. Allen, Henry Holt and Company; E. L. Thorndike, Rand, McNally & Company; W. L. Vosburgh, F. W. Gentleman, and J. O. Hassler, The Macmillan Company; G. A. Wentworth, D. E. Smith, and J. C. Brown, Ginn and Company; D. E. Smith, J. A. Foberg, and W. D. Reeve, Ginn and Company.

These books are in two-volume or three-volume series. The writer believes that a good start in preparation for teaching mathematics in the seventh, eighth, and ninth grades may be made by beginning with a study of the materials and methods found in the different series of books named.

CHAPTER XI

THE PRACTICAL ARTS

I. EARLY FORMS OF INSTRUCTION IN THE MANUAL ARTS

Instruction by parents. In savage life the education of children, which consisted almost wholly in securing command of some form of the manual arts, was directed by parents. The boy was taught by the father to fish and to stalk, trap, and slay game; the girl was taught by the mother to convert the game into food and clothing.

With the domestication of animals and the cultivation of plants, man entered upon a higher stage of civilization. Women invented better methods for the preparation of food and clothing, designed decorations for the home, and, by means of cultivation, added the products of the fields to those of the forests, thus becoming the founders of household arts and of agriculture. Men captured and domesticated animals and invented new forms of tools or improved old ones, thus laying the foundation for the development of commerce and industry. Just as the manual arts provided the subject materials of education among early peoples, so the fathers and mothers were the only responsible teachers for many hundreds of years.

The Greeks, who depended on slaves for the preparation of their food and clothing, were little interested in the development of the manual arts. On the other hand, the Romans turned to commercial and industrial life with the greatest enthusiasm. At one time agriculture was the chief business of the Roman people, both rich and poor. The head of every family was supposed to own and cultivate land.

The Roman citizen might be a poor man working in the field, but he was none the less respected. The Roman mother was held in high esteem by all members of her family. She was encouraged to make her home a suitable dwelling place for her husband and children. She was expected to teach her daughters the fundamental principles and practices of home-making, just as the father was looked to for the training of his sons in the commercial, industrial, or agricultural occupations. Thus labor with the hands was dignified, and this gave great impetus to the development of the manual arts.

Instruction by religious teachers. With the reduction to slavery of enemies captured in war, and with the addition of wealth plundered from other nations, the Roman people entered upon an era of decadence. The fields were turned over to the slaves, the homes became corrupted with riotous banqueting, and the manual arts decayed with the declining interests of a once vigorous people. The barbaric invasions, with the consequent social and governmental confusion and uncertainty, caused further decline in manual arts through the period we call the Dark Ages.

To certain religious orders, however, credit must be given for keeping alive a genuine interest in the cultivation of the fields and in laboring with the hands. Among these religious groups the one organized by St. Benedict A.D. 529 stands at the head. One of the rules of this order required that every monk should spend at least seven hours a day in some kind of labor. A considerable part of this time might be spent in cultivating the gardens or fields, in working in wood, metal, leather, or cloth, or in constructing buildings.

The members of the order worked constantly with the poor, the sick, the wounded, or the distressed, and in this way ingratiated themselves with the masses. But the monks went far beyond the mere alleviation of suffering. They not only set an example in the use of the manual arts, but they taught these to the people with whom they came in contact. Children and adults alike, coming under their influence, were inspired with greater respect for the crafts and for the cultivation of the fields.

The apprentice system of instruction. By the latter part of the eleventh century, trades and industries were sufficiently developed to call for some kind of group organization. In response to this demand, trade or craft guilds arose. Three groups of people were admitted to membership: the masters or fully trained workmen, the journeymen or paid assistants, and the apprentices.

The master was often merchant for his own wares. The front of his house was frequently used as a storeroom where his products were displayed and sold, sometimes by his wife or daughter. His workshop occupied the rear of the building, and over this were erected the sleeping quarters for the journeymen and apprentices, who frequently constituted a part of his family.

The guild made the rules governing the prices and qualities of the master's workmanship, his relationship to the journeymen who worked with him, as well as his duties and obligations to the apprentices who were usually bound to him for a term of years. The guilds not only corresponded to our present-day labor organizations, but they also undertook enterprises that contributed to the welfare of their members. Among these enterprises was the organization of schools for giving instruction in the elementary branches. Some of these schools were later developed into the great middle schools of western Europe.

The apprenticeship system thus became the leading method of instruction in the industrial arts and continued so for hundreds of years, or until the invention of machinery cheapened products so that the master with his simple tools could no longer survive. As the procedure in teaching, the master set before his pupil worthy models, demonstrated the proper care and use of tools, and then required the learner to perform in his presence the steps required for mastering the trade. Much of the procedure employed in the apprentice system of instruction may be found in use in the best manual-arts schools of the present time.

II. HOW THE MANUAL ARTS CAME INTO THE SCHOOLS

Different aims proposed. Rousseau proposed in 1762 that his mythical pupil Émile should learn a trade, not so much for the practical use that he might make of it as for the social benefit that would be derived from a knowledge of experiences encountered by those who were compelled to ply some trade for a livelihood. His chief purpose in introducing the manual arts was to destroy class prejudices or to broaden social sympathies.

Pestalozzi introduced the industrial subjects for two distinct purposes. In his first school, at Neuhof, he thought that children who were very poor might be made to support themselves by engaging in remunerative occupations. At first no attempt was made to relate manual labor to school work. The Neuhof enterprise ended in disastrous failure. Later Pestalozzi advocated the use of the manual arts as a means for developing sense perception.

Froebel, in introducing hand-training into the kindergarten, accepted neither the social aim of Rousseau nor the economic or mental-development theories of Pestalozzi, but proposed to make it a means for developing and expressing the child's own ideas.

Manual training was brought into the schools of the United States with the belief that it would give a discipline which would be useful in a general way to all who might take it, and that it would be of special value to those who might wish to enter the trades. But because of its lack of content the work was found difficult to motivate.

When the new psychology began to challenge the theory of formal discipline, the advocates of manual training were forced to reorganize the work. Professor John Dewey proposed that projects in the manual arts should be undertaken for the purpose of introducing the pupil to life conditions. More recently this aim has been expressed in the middle grades by the organization of so-called exploratory courses to be taken with a view to the discovery or development of permanent interests in some form of industrial life as a vocation.

The revival of the manual arts. In the eighteenth and nineteenth centuries needlework, embroidery, and lace-making were taught in private schools for girls in England and America, largely for social reasons. Certain institutions attended by young girls from homes of the well-to-do were known as "finishing schools." The programs of these schools were intended to prepare for the use of leisure time rather than for gainful occupations.

Cooking, sewing, and housewifery were taken up in different countries about the middle of the last century for the purpose of improving home conditions. Industrial changes were causing women to leave their homes for the factories. To take one illustration, home conditions became so bad in Belgium that the great strike of 1886 was partly attributed to the inefficiency of housewives. In 1865 a school of household training for girls was opened at Göteborg, Sweden; and in 1872 Crown Princess Louise of Denmark started a school for the training of servants. Thus, beginning about the middle of the last century, the movement providing schools for teaching household arts swept over Europe and America as a result of the following causes: (1) a social need for giving to girls from well-to-do families an occupation for leisure time, (2) a demand for improving the living conditions of the poor, (3) a call for vocational training, and (4) a demand for the improvement of home conditions in general.

Industrial training for boys, which was developed in the first part of the nineteenth century, stressed preparation for some trade. The movement led to the establishment of the many forms of trade schools now common in the countries of western Europe. These schools took the place of the apprentice system, which became obsolete because of the introduction of machinery, with the consequent changes in industrial life.

The manual-training movement, which first appeared in Finland, Norway, and Russia, grew out of economic conditions. Handwork was rapidly passing from the homes. To revive an interest in this activity, certain forms of the manual arts, such as wood-carving, basket-weaving, bench work, and metal work, were introduced into the schools. An educational leader by the name of Cygnæus, who was familiar with the writings of Pestalozzi and Froebel, advocated manual training for its educational values. In 1866 the government of Finland directed that manual training should be made a required subject in all training schools and in town and country schools. In the decree it was stated that the work was not intended to compete with the different crafts, but was to be employed as a means for developing "manual dexterity." Sloyd, a form of handwork, originated in Sweden as the result of a movement which had for its purpose the revival of home industries; but this, too, soon took on an educational aspect. Manual training was soon taken up in different countries, coming into the

United States as a result of an exhibition of work from Moscow, Russia, at the Philadelphia Centennial in 1876.

The invention of machinery led to the concentration of people in towns or cities, a movement which greatly subtracted from interest in agricultural pursuits. In 1806 a Swiss reformer by the name of Emanuel Fellenberg opened a school at Hofwyl, near Bern, for the training of boys in the crafts and in agriculture. Later a school for girls was added. Although Fellenberg's school was organized with literary and industrial departments, he considered agriculture most important. Both rich and poor were welcomed to the school, which aimed to accomplish two purposes: (1) the training of the peasant classes for agricultural pursuits and (2) the development of sympathetic relationships between the upper and lower groups in society. Fellenberg prepared not only artisans but also teachers for the rural schools. Other schools, copied after the Hofwyl plan, which combined literary and manual work under home conditions as far as possible, spread rapidly, so that Henry Barnard wrote, "In each of the cantons of Switzerland, in 1852, there was at least one rural or farm school conducted on the basis of a well-regulated family." The movement spread to other countries, reaching America about 1825. Instead of developing as in the Old World, the movement in America was taken up by the secondary schools. The educational aspects, however, were largely subordinated to the idea of providing some means of support for poor students.

Thus the origin of three general divisions of the manual arts found in the schools today — household arts, crafts and trades, and agriculture — may be traced to definite social and economic conditions existing in western Europe in the nineteenth century.

Introduction of the manual arts into the middle grades. Agriculture came into the middle grades as a result of movements from opposite directions. The school-garden movement, which had become popular in European countries, was brought to the United States about the beginning of the present century. Although at first the gardens were largely under the auspices of garden associations outside the schools, they contributed to the general movement toward the introduction of elementary agriculture into the public schools. The war gardens of 1917 and 1918 also added impetus to the movement. The influences from above came through the introduction of the sciences, at first into the colleges, next into the secondary schools, and finally into the middle grades. The development of agricultural colleges, the establishment of agricultural experiment stations in response to the demand for more scientific farming, the awarding of prizes by chambers of commerce, and the organization of farm clubs for boys and girls have all contributed to the teaching of agriculture in the schools. Finally, the movement from below has met the movement from above in a fusion which has resulted in a demand for a complete outline of work in nature study and agriculture for the middle grades.

As has already been indicated, sewing was taught in the "finishing schools" of the United States in the early part of the last century. Soon after 1850 an unsuccessful attempt was made to extend needlework into the lower grades.[1]

By the beginning of the last quarter of the nineteenth century various women's organizations began to open private cooking schools. The Woman's Educational Association of Boston, under whose auspices the Boston Cooking School had been opened in 1879, requested permission to open classes in cooking in the Boston public schools. The privilege was granted, and in 1886 the work was taken over by the school board. In 1880, classes in household arts were opened in the

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[1] Paul Monroe, *Cyclopedia of Education*, Vol. III, p. 32.

Girls High School of Philadelphia, with an extension of the work into the upper grades of the elementary schools some five years later. From these dates the teaching of sewing and cooking in the schools has been continuous, until today no public school enrolling girls above twelve years of age would consider itself adequately equipped that did not provide instruction in household arts.

The type of industrial education now proposed for the middle grades is also a result of different influences. The Pestalozzian idea of training for a special trade became well established in European schools in the first half of the last century. This led to the establishment of many varieties of trade schools in Europe, but the plan did not prove so popular in this country.

With the introduction of the kindergarten into the American school system about 1860, came the use of the "occupations" and "busy work." This work included the employment of pencils, scissors, knives, and different materials in the construction of various kinds of objects. The work was soon extended up into the elementary grades. According to S. C. Parker, a "whittling school" was opened in Boston in 1871 by private citizens who wished to experiment with certain types of manual training in the upper grades of the elementary schools. The coöperation of the public-school authorities was secured in 1882. In 1886 a Mr. Larson was brought from Europe for the purpose of introducing the Swedish sloyd.

In response to a petition from leading manufacturers the legislature of Massachusetts passed a law in 1870 providing that evening drawing schools should be established in large cities, and that drawing should be added to the program of studies in the public schools. This was done to provide skilled workers in the industrial arts.

The first manual-training high school in the United States was opened in connection with Washington University, St. Louis, in 1880. In the same year the Workingmen's School was opened in New York City by the Ethical Culture Society. In this school manual training appeared in the elementary grades. By the end of the century manual training was taught in many schools, but soon thereafter critics began to complain that the work had not justified itself. Because of its formal nature it failed to appeal to pupils. It was held that the practical problems and projects of everyday life would lend zest to the work and at the same time prepare the pupils for definite occupations. But at this point the objection was offered that pupils in the middle grades should not be required to take up a trade. This last view has led finally to the introduction of exploratory courses in the industrial subjects with a view to giving the student some acquaintance with different trades and crafts so that he may be better able to choose an occupation at a later date. Thus, again, we find influences coming up from the grades below meeting with influences coming down from the grades above to form a new program for teaching the industrial arts in the middle grades.

III. MANUAL-ARTS MATERIALS FOR THE MIDDLE GRADES

Household arts. The best authorities on the teaching of household arts advise that two types of courses should be provided in the schools: a general course for all girls that will prepare for housekeeping, motherhood, or for common participation in the enjoyment of domestic life, and special courses for those who may desire to become specialists in the further development of the several phases of home economics. Pupils are expected to give to the general course the same amount of time that is given to any one of the regular academic subjects; in the special courses much more time is to be required. The special courses are not recommended for pupils in the middle grades.

Since boys as well as girls are in need of certain knowledge falling within the field of household arts, abbreviated courses should be arranged. This may be done by selecting from the general course for all girls such topics as will best meet the needs of boys. For this work the boys should be placed in separate classes. Such an arrangement will tend to destroy the too common belief that food, clothing, and shelter are matters of concern only to girls. It will also save embarrassment to the boys by avoiding competition between the sexes. Since girls from childhood are called upon to assist continuously with household duties, they would naturally outstrip the boys in such work. A greater reason for separation, of course, is that the girls should have much more training in household arts than boys should.

The field of household arts is so large, the phases are so numerous, and the opportunities are so great that there should be no surprise when it is discovered that teachers do not agree as to the exact work to be included in courses of study. The locality and type of school, the available equipment, the preparation of the teacher, as well as the aim of the course, should be taken into consideration in the selection of the topics to be used. The topics taught and the school years to which they are assigned will differ from school to school.

The Commission on the Reorganization of Secondary Education makes the following statement:[1]

> In some schools the needs of the pupils make it desirable to begin definite home economics training in the fourth grade, but under ordinary circumstances this should begin in the fifth.

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[1] *United States Bureau of Education Bulletin No. 5* (1922), p. 11.

Simple food preparation and housewifery should be the chief topics in the home-making classes throughout the fifth grade and sewing and food preparation should be given in the sixth grade with a constant review of the housewifery practices taught in the preceding grade.

The dominant thought of the fifth and sixth grade food work should be "What foods are needed by children of this age in order that they may grow and be strong." The actual cookery should be of the common and least expensive foods and by the simplest methods. . . .

The sewing should consist of simple projects adapted to the interest of the children at the period of their development. Work which requires close application and fine exact motions is physiologically objectionable.

Housewifery lessons should consist of teaching the care of a bedroom, table setting, careful dusting, and dishwashing.

The spirit and motive of home economics teaching should differ in these grades from the spirit and motive in the junior high school.

As to the subject matter that should be completed by the end of the sixth grade, the Commission makes the following recommendation:

It is concluded that a girl entering the seventh grade should know how to follow a simple recipe accurately, to measure food materials correctly, and to regulate temperatures for boiling and baking. She should be able to assist dexterously in making a bed, caring for toilet articles, setting a table, dusting a room, washing dishes, and putting away fresh and cooked foods. She should be able to sew a straight seam on the sewing machine, cut by a two-piece commercial pattern, baste seams, darn her stockings, sew on buttons, work buttonholes, and wash and iron small light articles of cotton and linen. She should understand the more elementary facts concerning the right choice of foods and household furnishings. With this foundation she will be prepared to profit by the course hereinafter recommended.

Household-arts materials in the seventh, eighth, and ninth grades. A detailed outline of the work in home economics for the seventh, eighth, and ninth grades may be found in the bulletin just cited.

The work of the seventh grade is outlined for each of the four quarters of the school year. The first and fourth quarters are given to clothing, the second and third quarters to cooking. The subject matter for each quarter is classified under three headings: (1) school projects, (2) home projects, and (3) investigation, reports, and recitations.

In the eighth grade the first and second quarters of the school year are given to foods, the third and fourth to clothing. Here, as in the seventh grade, the work is carried on by means of school and home projects with reports and class recitations.

For the work of the ninth grade a survey course is outlined. The aims of this course as stated by the Commission are:

1. To give a well-rounded conception of the many studies contributing to worthy home membership.
2. To arouse interest leading to election of more detailed courses in the senior high school.
3. To help the girls who must leave school at the end of the ninth grade.

The work of the year is distributed as follows: first quarter, clothing; second quarter, foods; third quarter, the home and its care; fourth quarter, family and personal finances.

Gardening. The nature-study work outlined in Chapter IX for the fourth, fifth, and sixth grades may very properly include elements of home and school gardening.

Two general types of gardens prevail: the one under the immediate control of the school, located on the school grounds or close by, the other conducted by the pupils at home with or without close school supervision.

There are also two methods for assigning work: the individual plot, and the garden under the care of a group or class. The former is best adapted to the home garden; the latter may be operated best at school.

The home garden possesses certain advantages over the school garden, since the pupil can care for it during vacation and thus carry to completion any project undertaken; but, on the other hand, the instruction and supervision by the teacher may be less effective. Probably the best results will be obtained when the school garden is used for purposes of demonstration and the home garden for project work by individual pupils.

Care of the school garden during the vacation period has always been a serious problem, the solution of which will depend largely upon the location of the school. In rural schools, if there is a teacherage on or near the school grounds, the teacher may care for the garden and enjoy the use of the products. If the school garden is located in a town or city, different procedures may be applied: the teacher may supervise the work with or without aid from pupils, or a janitor or other person may be employed to take charge during the vacation period.

The subject matter of gardening will include such topics as kinds of flowers or vegetables, plant structure and growth, garden-planning, preparation and qualities of the soil, selection of seed, planting, germination, the cultivation and care of growing plants, diseases and insects which injure plants, the gathering, care, and use or marketing of products, and so on. Theoretical or class work should, of course, correspond to the different phases of field work. The topics and the extent to which they are treated should depend upon the work done in previous grades as well as the grade in which the work is to be carried on. Window gardens may be started in the first grade. If a good course in nature study has been pursued in the lower grades, pupils will be prepared for excellent work in the elements of gardening in the fifth and sixth grades.

Agriculture in the seventh and eighth grades. It is the consensus of opinion of teachers of agriculture that the work in this subject for the seventh and eighth grades should be largely of the exploratory, or prevocational, type. Especially should this be true with regard to the courses in town or city school systems. In the case of schools organized for the specific purpose of giving instruction in agriculture, the work may be directed more toward the vocational aspects.

The subject matter in agriculture appropriate to the seventh and eighth grades will vary with the amount of work in nature study and gardening already completed in the fifth and sixth grades. The aim too — whether nonvocational, prevocational, or vocational — will have much to do with the selection of subject materials. If gardening has not been taught in the fifth or the sixth grade it may very properly be included in the general-science course in the seventh grade. If agriculture takes the place of general science in the seventh grade, soils and plant propagation should constitute the subject matter of the course. Animals and field crops may then be studied in the eighth grade. In the ninth grade more specialized courses on vegetables, poultry, farm animals, or farm crops may be taken by pupils who continue in agriculture. Farm engineering and farm management may then be studied in the senior high school.

As far as possible the subject matter in seventh-grade and eighth-grade agriculture should include class instruction, controlled laboratory demonstration with experimentation, and field projects.

In the work on soils the following factors may be studied: kinds of soil, sources of soils, air and soils, water and soils, effects of wind, rain, heat, and cold on soils, effects of plant and animal life on soils, cultivation, irrigation, and drainage of soils, rotation of crops, and different kinds of fertilizers.

The study of plants may include their composition, structure, different ways of propagation, effects of light, heat, and water on plants, plants and soils, classification, habitats, different steps in plant cultivation, and uses of plants for food, clothing, or shelter. The extent to which these topics are treated should depend, of course, on the previous experiences of pupils.

The kinds of farm crops to be studied will depend upon the products of the community in which the school is located. It should be remembered that the main purpose of the course on crops, at this time, is not vocational but exploratory. If the concrete conditions surrounding the child cannot be made to appeal, there is little hope that a study of books will lead him to become greatly interested. This would mean that pupils in the several states or in different parts of the same state should begin with different crops. For Iowa children the crop of most immediate interest would be corn; for children in California, fruits; for pupils in central Texas, cotton. For children in each state or in each locality the desired results should be the same: the establishment of personal relationships with natural laws and physical conditions which contribute directly to the support of an important phase of economic life.

The principles applied to the selection of materials in the study of crops should also be used in the study of animal life. In one locality the topic may be cattle; in another, hogs; in still another, sheep. Here, as with the study of crops, the aim is not so much vocational as prevocational or nonvocational.

To acquaint children with the forms, classes, uses, habits, and nurture of animals will mean that additional interests may be aroused which will contribute to the proper use of leisure time. The care of pets, the improvement of a strain of fowls by selection and feeding, the care of bees, or the development of a dairy may fill the odd hours of an adult with the highest entertainment when the time might otherwise be uselessly or evilly spent. There is a void in the life of a child who has never cared for a pet; the void is still greater in the life of an adult who has no interest in animal life. It follows, therefore, that there is a defect in the education of any child who is permitted to grow up without coming in direct contact with some of the lower members of the animal kingdom.

While descriptions, pictures, and mounted specimens of birds and animals may be used in class discussions and for purposes of demonstration, the best types of subject matter will always be the living creatures. It may not always be possible to secure the living animals desired, but some specimens should be made available for every school.

Although many textbooks on the teaching of different phases of agriculture have appeared within the last twenty-five years, although books on nature study are numerous, and although some excellent textbooks on general science are available, there is still room for some good texts on the teaching of elementary agriculture in the seventh and eighth grades. What seems most needed is a series of books for the middle grades that will unify nature study, gardening, general science, and the elements of agriculture into a systematic course such as has already been provided for teaching mathematics. Until such books are available it will be necessary for the teacher to select a series of topics suitable to the different grades and then draw on many sources for supporting materials. For thoroughly prepared teachers a series of textbooks may not be necessary; but unfortunately many of the teachers in the middle grades are poorly trained. Especially is this true in the newer subjects, of which elementary agriculture is a good example.

Drawing. Drawing is an essential factor in many of the practical arts. As so used, however, it must be looked upon as a tool subject rather than as a content subject.

In order to gain control of the subject of drawing for use in the manual or industrial arts, certain principles must be mastered. For a long time drawing was taught as a subject by itself without immediate application to the services for which it was intended. Because of lack of proper motivation the drawing lesson was often regarded by pupils as a piece of drudgery to be endured but not to be enjoyed. The author had the pleasure of substituting a system of practical drawing for a system of formal mechanical drawing in one school system and witnessed a change of attitude on the part of teachers and pupils from one of antagonism to the subject to one of real enthusiasm.

The work in drawing should begin with the kindergarten and continue throughout life. The study of drawing in any grade should be correlated with the other manual arts in the grade.

Freehand and mechanical drawing will be needed in such phases of the practical arts as dressmaking, house-furnishing, gardening, woodworking, sheet-metal work, plumbing, electrical work, pattern-making, automobile mechanics, cement work, forging, machine-shop work — the elements of all of which may be taught in the middle grades. Aside from the use of drawing in the applied arts, many opportunities will be afforded for its exercise in connection with work in other school subjects; in short, drawing should be treated not as an end in itself but as a means for interpreting and expressing ideas.

Manual training. Much that was said of the subject matter in drawing is equally applicable to the subject matter in manual training. If the term is to be used at all, it must be given a different meaning from the one it conveyed for many years. As with drawing, an attempt was made to teach manual training without giving to it a living content. Today the subject matter of manual training is thought of as consisting in the development of some problem or project in the manual arts. It should be used for a training of the hands in the actual performance of some valuable service.

Trades and industries. Certain serious difficulties have arisen in the selection of subject matter in trades and industries for pupils in the middle grades. While progressive school people feel that courses in the practical arts should be provided in these grades, opinions differ as to what these courses should be and as to how they should be administered. Some insist that short prevocational, or exploratory, courses should be provided in many trades; others would limit the number of courses offered. The arguments of those who would limit the courses are (1) that frequent change of work destroys interest, (2) that equipment and competent instruction in many lines are expensive, (3) that there are so many trades and industries that, at most, only a small number of those available may be chosen, and (4) that the pupils in any school will ultimately be scattered among many trades and industries not represented in the schools. Arguments favoring a large number of arts courses are (1) that even a limited acquaintanceship with different trades will improve the general attitude toward manual work, (2) that the expenditure would be justified, (3) that teachers may be trained, and (4) that a large number of choices should be offered so that as many pupils as possible may later make the right selections of occupations.

An examination of the programs of study published by different cities in this country discloses the fact that the selection of subject matter in trades and industries for the seventh, eighth, and ninth grades is still in the experimental stage.

The courses offered in different schools of the same city often vary as much as those offered in different cities. Los Angeles reported in 1922 as follows:[1]

> One school has organized shop units for boys in cement and concrete work, simple electrical wiring and battery work, forge work, woodwork, sheet-metal work, and household mechanics.
>
> Another school is beginning with a semester of woodwork and is following this up with ten-weeks units in sheet metal, household plumbing, elementary electricity, automobile work, cement work, and printing.
>
> Still another school, somewhat limited as yet in equipment, has, in addition to its woodwork and home mechanics, classes in agriculture to which are sent the best and poorest from the woodwork class, the former because they have finished practically all the necessary work, the latter because it is hoped they may be saved by giving them work out in the open.

A majority of the prevocational courses in the seventh and eighth grades in the Los Angeles schools cover ten weeks of four forty-minute periods each; in the ninth grade the courses cover twenty weeks each.

It seems clear that any single outline of subject matter in the trades and industries would fail to meet the needs of schools throughout the country. The size of the school, local industries, available funds, and the desire for further experimentation should determine the phases of the work to be undertaken.

Unsettled as the subject materials in the trades and industries are, the large number of boys and girls who leave school in the seventh, eighth, and ninth grades, the fact that some children are either not attracted by the literary studies or are not competent to carry them, and the belief that some personal contact with the trades will tend to develop a greater respect for those engaged in manual occupations, will continue to cause many people to insist that suitable courses in the practical arts be developed for the middle grades of the public schools.

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[1] *Vocational Courses in the Los Angeles City High Schools* (1922), pp. 88–90.

IV. METHODS IN THE PRACTICAL ARTS

Methods in drawing and manual training. The same fundamental principle of teaching was formerly applied to both mechanical drawing and manual training. This principle was first proposed by Pestalozzi for the teaching of drawing. He thought that since figures are made up of straight lines and curves, a careful study of the segments of these would lead pupils to become efficient draftsmen. Consequently the child was taught to bisect lines and angles, to draw perpendicular or parallel lines, and to construct figures from line segments. The figures proposed were often meaningless within themselves and without purpose so far as pupils could understand. This method of teaching finally brought mechanical drawing into disfavor.

When manual training was introduced into the schools, it was coupled with mechanical drawing; hence the methods used in teaching drawing were applied to manual training. This meant that the parts of objects were studied thoroughly before any attempt was made to construct a whole. Borings, joints, edges, and surfaces of various kinds were prepared before an attempt was made to apply them in the construction of real objects. Often much time was spent on the study of materials with little reference to their uses, or lectures were delivered on the care and use of tools which the instructor sometimes took pains to guard from the hands of pupils. These methods soon led, in part, to the unpopularity of the old type of manual training.

Early teachers of drawing and manual training made the mistake of attempting to make these subjects ends in themselves instead of using them merely as means to be used in the attainment of higher aims. It has since been learned that when the pupil is impelled by some desired end his interest will be quickened, his effort will be strengthened, and his accomplishment will be increased. Instead of putting the pupil to work on the disorganized fragments of an object in drawing or manual training, he is now taught to think of the object as a whole. It has been found that this procedure adds interest to his drawing and dexterity to his use of tools. Instruction in details must still be given, but the suggestions of the teacher are now sought and have real meaning, because they are connected with practical situations.

Methods in household arts. Well-selected subject matter in the household arts lends itself readily to the highest types of teaching so far devised. This is true because of the following fundamental conditions: (1) food and clothing are matters of immediate interest to all civilized human beings; (2) an extraordinary amount of appeal may be made to the special senses; (3) almost a complete command of the teaching materials may be enjoyed; (4) the instruction in school may be applied directly to home projects.

The work may be carried on by means of lectures or discussions, by drawn, written, or printed representations, by demonstrations, by directions in laboratory procedure, or by experimentation on the part of the pupils themselves. What could be more fascinating in the whole domain of learning than the privilege to use books, pictures, the experiences of teachers, the counsel of friends, and personal observations in gathering ideas on a problem in food or clothing, and then to have the opportunity of expressing those ideas in a product whose value may be tested by immediate use? If the household arts are not well taught, it is not because they do not provide good subject materials or because the materials do not lend themselves to approved methods of instruction.

Methods for teaching gardening and agriculture. Here, again, theoretically at least, we have an opportunity to apply the most vitalized forms of instruction. Books, demonstration, directed study, laboratory supervision, and project or field work, may all be used. Unfortunately practical experience often leaves much to be desired. Probably the greatest impediment to the successful teaching of gardening and agriculture is the lack of convenient field facilities. In any case considerable time is required for passing to and from the work. There is a strong temptation to slight the applied side and to fall back on the textbook with class recitation. Moreover, it is not so easy to connect the school work with home projects as it is in the case of the household arts. Furthermore, some pupils will not find as much immediate inspiration in the work as is aroused by the daily interest in food and clothing.

Whatever may be the conditions, a well-prepared and enthusiastic teacher may make the work interesting. This will be done by the selection of suitable phases of the subjects, by directing pupils to suitable collateral readings, by the use of interesting demonstrations, by close supervision of the school gardens, and by extending helpful encouragement to any pupils who may be able and willing to undertake home projects.

Methods in the trades and industries. In general, the methods to be applied in teaching the courses in trades and industries are the same as those used in the other practical arts. In the first place, the work is usually made up in the form of unit problems or projects. This gives definiteness to the proposals, and this tends to motivate study.

Not all the courses, however, are constructed on the basis of manual participation by pupils. A study of occupations or industries may be made through visitation and inspection, for it may not be possible to provide all the equipment required for courses given. This will make necessary the use of theoretical instruction.

To give the pupils some acquaintance with as many trades as possible, the single-shop idea has been introduced. The new form of shop is constructed with few partitions, so that those working at different projects may come into frequent contact. This arrangement not only facilitates the easy transfer from one trade to another but often enables the pupils to know what is going on in different units of work at the same time.

While the completion of projects in the exploratory courses should be encouraged, it should be remembered that the chief object is not to produce technical skill but to give insight into the nature of different trades. To accomplish this purpose, pupils should be encouraged to read as widely as possible concerning the trades and industries selected for shop practice.

V. UNITS OF WORK IN THE PRACTICAL ARTS

Problem-Project for the Fourth Grade

General problem. To learn something of the uses and manufacture of fire-made and sun-dried brick.

Problem-project. To study the process of brickmaking and to make some small specimens of sun-dried brick.

Procedure. 1. The settings for this study will vary with the community in which the work is to be done. In the Southwest, where adobe brick is still in use, the work may be started by a discussion of the forms, costs, uses, and manufacture of sun-dried brick.

2. After the study of local conditions, pupils may be led to an inquiry into the history of brickmaking. The following

questions might be raised: Under what climatic conditions should you expect sun-dried brick to be made and used? In what countries do they use sun-dried brick today? Readings may be assigned telling of the building materials used by the Egyptians, the Pueblo Indians, the Mexicans, and others. Pictures may be used to good advantage in arousing interest.

3. In the northern and eastern parts of the United States it would be better to begin the study with fire-made brick. The pupils may be permitted to name the various uses made of brick in the community in which they live. The question as to whether all bricks are alike may lead to further study. Samples of various kinds of brick may be selected for examination. The question as to why some bricks are hard and some soft may be used to stimulate further investigation. Tiling, terra cotta, earthenware, soft and hard brick, may be discussed with reference to materials required for their manufacture.

4. The steps in manufacture may be taken up. The materials required, the molds and machinery used, arrangements for burning, methods of applying heat, the time necessary for burning, and so on may be studied. Under marketing the following factors may be considered: selection, transportation, freight rates, and prices in local markets. Under the heading of bricklaying such matters as tools, wages, and the skill required may be discussed.

5. Whether the problem is opened with a discussion of sun-dried or fire-made brick, pupils should be led to a study of early brickmaking and finally to the project of making sun-dried brick. For the completion of the project, sand, clay, straw or some other binder, a mixing basin, molds, and a drying table will be necessary. A study of the uses of the different materials and processes should be made as the project is carried forward. The project may be carried out

on a small scale in the schoolroom or in a laboratory. Pupils may be interested in repeating the project at home. This project is proposed for the purpose of interesting pupils in an industry that is thousands of years old and is still today of vast importance to the welfare of the human race.

Project for the Sixth Grade

General problem. Vegetable gardening.

Special project. To prepare the soil for planting a vegetable garden.

Procedure. 1. The observations and knowledge of pupils concerning the kinds of soil needed for different products should be tested. Pupils have noticed in traveling about that different kinds of trees grow in different soils. They may also be able to state that sandy soils will produce melons, sweet potatoes, berries, etc. but will not be so good for wheat, corn, cotton, etc.

2. In preparing for a vegetable garden the first step will be to decide what vegetables are to be grown. When that has been settled, it will then be in order to determine what kinds of soil the different plants will demand. This may be learned from publications and from experienced vegetable growers.

3. A field trip to streams, fields, woods, or gardens may be made for the purpose of studying different soil formations. Samples may be carried back to the laboratory for more intensive study. Pupils may be interested in the natural locations of soils and in the causes that produce them.

4. Different soils may be built up in the laboratory and tested for moisture and acidity.

5. When the preliminary work is done, the soils in the plot to be used may be examined. Then may follow the actual preparation, which will consist in spading or plowing, in mixing and placing fertilizers, in working the ground to proper

texture, and in preparing the rows, furrows, or ditches for receiving the seeds or plants.

The planting and cultivation of the plants may be taken up as a part of the general project of vegetable-growing. The project outlined may be adapted to different levels of pupil advancement. The treatment of soils may be limited or extended to suit the needs of pupils in different grades.

Project for the Seventh Grade

General problem. The preparation and serving of food.

Procedure. 1. Many pupils will be able to give their experiences in connection with preparing and serving the morning meal. Many of the breakfasts served are poorly selected and improperly prepared. The object of this project is to improve the standards in use.

2. Pupils may be allowed to present different breakfast menus. These may be secured from books or from home practices. The different articles listed may be classified under the headings fruits, cereals, meats, eggs, breads, and drinks.

3. Varieties within each class of food and the different ways in which they may be served should be studied. Markets may be visited and prices secured. Ways of caring for foods in the markets and in the home may be noted. Such matters as refrigeration, protection from vermin, and the condition of containers are important.

4. Finally will come the actual selection, preparation, and serving of the meal. These factors will include the selection of the menu, the determination of the number to be served, the purchase of the articles, the proper preparation of each article, the order of service, and the observance of proper table etiquette.

The completion of the project in school should be followed by repetition in the home, with suitable records and reports.

The preparation and serving of luncheons and dinners may be organized as other project units.

Project for the Eighth Grade

General problem. The care of automobiles.

Special project. Oiling a car.

Procedure. 1. Some pupils will already have had some experience in oiling cars and will be able to assist in making a list of the materials needed. As soon as the list is made, the necessary equipment should be made available. This will include an automobile, tools, lubricants, etc.

2. A study of materials used may next be undertaken. Experienced pupils or the instructor may demonstrate uses of tools. Properties and costs of lubricants should receive attention.

3. With the aid of a complete diagram the parts of the car to be oiled may be located. Pupils may test their knowledge from time to time by making drawings showing the points to be lubricated.

4. Before applying the lubricants, proper dress should be provided for the workman and provisions should be made for protecting parts of the car not to be oiled. The practical part of the work may then proceed.

Oiling a car not only is an important matter in itself but will give opportunity for learning such parts of a car as may need mending later. The completion of this project may lead to other units of study in automobile mechanics, based upon the engine, the ignition system, the carburetor, the driving system, etc.

Problem in Occupations for the Ninth Grade

Ultimate aim. To prepare pupils for the intelligent selection of future occupations.

Immediate aim. To study the duties and opportunities of an office clerk and to ascertain the desirability of becoming one.

The following outline is condensed from *Occupational Studies*, Monograph No. 10, Pittsburgh Public Schools:

1. Definitions
    - *a.* General Clerk
    - *b.* File Clerk
    - *c.* Time Clerk
    - *d.* Receiving Clerk
    - *e.* Shipping Clerk
    - *f.* Stock Clerk
2. Duties of each type of clerk named.
3. Vocational knowledge necessary to fill the different positions.
4. Educational requirements. The minimum is placed in all cases at completion of the eighth or ninth grade.
5. Physical requirements. These include, for different positions, good eyesight, general health, type of build, stature, ability to stand exposure, ability to stand confining work, etc.
6. Compensation. Upper and lower ranges given.
7. Possibilities of promotion. The different positions to which each clerkship may lead are mentioned.

This outline is given as typical of unit studies in prevocational guidance. Units of study on the machinist, the salesperson, the stationary engineer, the sheet-metal worker, the pattern maker, the barber, the structural steel worker, the messenger, the painter, the baker, the stenographer, the printer, and probably others, are now given in the Pittsburgh schools.

VI. CHAPTER SUMMARY

In the early stages of civilization, instruction had to do with some form of the manual arts. Boys were taught to hunt, fish, and fight; girls were trained in the preparation of food and clothing. With the domestication of animals, the improvement of tools, and the cultivation of the fields, a higher state of civilization appeared; but for a long time the education of children dealt largely with the practical arts.

During the Dark Ages, when interest in the manual arts was at a low level, certain religious orders endeavored to instruct the people in methods of agriculture and in the improvement of trades and industries. The order of St. Benedict was conspicuous for its contribution to instruction in the manual arts.

With the revival of interest in the trades and industries, the apprentice system arose. This system, which included some of the best teaching principles of modern times, continued in use until the invention of machinery caused many handmade products to become unprofitable.

The manual arts were first advocated as suitable subjects for school instruction by such educational reformers as Rousseau, Pestalozzi, Froebel, and, in more recent times, Dewey and others. Rousseau wanted the practical arts taught for their social values; Pestalozzi recommended them for the development of sense perception; Froebel desired to use them as means for self-expression. Finally, Dewey suggested that projects in the manual arts should be used to introduce the child to life conditions. This idea appears in the exploratory courses now proposed for the middle grades.

Household arts were first taught in "finishing schools" to daughters of leisure. Later they were introduced into the schools of Europe for the purpose of improving the home conditions of the poor and for the training of a servant class. In the latter part of the last century the movement reached America, where it was supported for a time by independent organizations before it was taken into the public schools.

The manual arts were revived and developed in certain European countries as a result of economic conditions, and finally found their way to the United States toward the end of the nineteenth century. In 1806 a Swiss reformer by the name of Fellenberg opened a school near Bern for the training of boys in crafts and in agriculture. The Fellenberg idea was brought to the United States about 1825 and was introduced into the secondary schools as a means of support for poor students.

The practical arts finally reached the middle grades by means of two different sets of influences coming from opposite directions. One came from the kindergarten and primary grades by way of object lessons, elementary science, and nature study; the other came from the high schools by way of home economics, manual training, agriculture, and phases of the industries. The blending of the two movements is resulting in the development of courses containing elements of the old subjects organized into more attractive forms and better suited to the interests and needs of children from nine to fifteen years of age.

While the authorities do not agree as to the exact materials in household arts which should be taught in the different grades, they do state that the work should begin with the fourth or fifth grade and that two types of courses should be offered. The prevailing opinion is that a general course should be arranged preparing for general housekeeping and that special courses should be provided for those who desire to become experts in certain fields of home economics. A condensed statement of the work in household arts recommended by the Commission on the Reorganization of Secondary Education for each of the middle grades may be used as a working basis by any school system.

School and home gardening is now considered an appropriate phase of the applied arts for pupils in the fifth and sixth years of school life. This should follow the work in nature study in the lower grades and be incorporated as a part of the courses in science in the fifth and sixth grades. Sometimes the gardening is made a part of the general-science course in the seventh grade or is substituted for it. While school gardens are better for demonstration, home gardens may be more easily cared for. The latter also lend themselves more readily to the completion of garden projects. The best arrangement prevails when both types of gardens are developed simultaneously.

Whereas courses in elementary agriculture have for some years been required of all pupils in the middle grades in certain European countries, notably in France and Switzerland, the movement is just now reaching the middle part of the school system in this country. It is now proposed to teach the elements of agriculture in the seventh and eighth grades — the subject matter to include phases of plant and animal life, with some study of soils and field crops. The work is to be organized in the form of exploratory courses, the subject materials to be determined largely by the local conditions surrounding any particular school. At present the preparation of printed materials, the equipment of suitable laboratories, the preparation of teachers, and the provision for field projects are still in the formative stage.

For some years after mechanical drawing and manual training were brought into the schools they were taught as ends in themselves. As a result of the methods used in teaching, these subjects soon became unpopular. They are now being forced to their rightful places as tool subjects in the field of the manual arts.

The last of the practical arts to enter the middle grades is a group of activities known as the trades and industries. The appearance of these subjects is to a considerable extent due to a demand for exploratory courses in the junior-high-school grades. Although these courses are still in the experimental stage, the general conditions of economic life and the trend of popular education seem to support the expectation that they will be increased rather than diminished, at least for many pupils who will never pass beyond the ninth grade.

Pestalozzi thought that since figures are composed of lines and segments these should be studied at first without reference to objects or completed wholes. This idea was made the foundation of early methods of teaching both mechanical drawing and manual training. Later it was decided to begin with practical problems and use drawing and manual training merely as tool subjects. This step has resulted in giving real motives for learning to draw and to handle tools.

Since the subject matter of household arts is of immediate interest to all normal children, and since the materials may be controlled in the laboratory or related directly to home conditions, the work may easily be motivated. In teaching the household arts all the best types of instruction, from a formal lecture to the use of the project, may be applied. The same may be said, in the main, with regard to the teaching of gardening or elementary agriculture.

Methods for teaching the exploratory courses in the trades, occupations, or industries will vary with the type and the extent of the course, with the equipment, and with the location of the school. In some courses only theoretical instruction may be possible; in others, projects may be used.

EXERCISES

1. Outline the effects of the apprentice system upon methods of teaching used in the schools today.

2. Explain how home economics came into the middle grades in this country.

3. Make a study of the work of Fellenberg's school at Hofwyl, Switzerland. Trace the effects of this school on the teaching of agriculture in Europe and in America.

4. Make a study of the founding and early work of the Manual Training School of Washington University, St. Louis (see *United States Bureau of Education Bulletin No. 3*, 1923).

5. Debate the question: *Resolved,* That boys should study home economics.

6. Enumerate the benefits that a professional man may derive from the care of a small garden.

7. Explain the effects of Pestalozzi's ideas on the teaching of drawing and manual training.

8. Give the arguments *for* and *against* the inclusion of a large number of exploratory courses in the practical arts for pupils in the middle grades.

9. It is sometimes said that certain pupils do better in the practical-arts subjects than they do in the academic subjects. In what different ways may this be explained?

10. Ascertain the attitudes of labor unions toward the introduction of industrial subjects into the schools.

11. Make a list of ten projects in home economics, in gardening, or in shop work for use in the middle grades.

12. Outline a project in each of the practical-arts subjects.

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CHAPTER XII

THE FINE ARTS AND ÆSTHETIC RELATIONSHIPS

I. ORIGINS AND DEVELOPMENTS

Two groups of the fine arts. The fine arts may be divided into two general groups: those that have to do with the spontaneous emotions connected with religious rites, martial preparations, celebrations, and social festivities, and those that tend to terminate in the modification of natural objects. To the former group we may assign dancing, music, literature, and dramatics; to the latter, architecture, sculpture, painting, and design.

Dancing. Dancing is among the oldest and most general of all physical exercises used by groups. On the purely biological side it may be traced to the inherent demand for bodily exercise; on the æsthetic side it seems to rest upon the pleasurable emotions derived from rhythmic movements.

The popularity of the dance, among both civilized and uncivilized peoples, comes probably from the fact that it lends itself to the stimulation of a great variety of emotions. It was employed by savages in connection with religious rites and military activities. The Greeks made dancing a means for uniting body, mind, and spirit in the highest form of self-expression. Thus it may be seen that this type of movement has been used to arouse the highest æsthetic emotions as well as the lowest passions.

It has often seemed strange to certain observers of formal education that an exercise so universal as dancing should receive so little attention in the training of the young. The assertion is sometimes made that this neglect has resulted in the surrender of an instrument for good to the forces of evil. For even today the social dance, although often opposed by strong moral forces, continues to be the most attractive source of pleasure for untold numbers of both adults and young people.

Music. To develop the dance into a social exercise, it was necessary to add music. Some rhythm was essential if movements were to be made in unison. At first rude sounds uttered by the dancers or the beating of sticks furnished the required rhythm. From these crude beginnings musical instruments, as well as all the splendid achievements in voice culture, have been developed. Because of its distinct accent, the drum has always been a favorite instrument for marching or keeping time. It is for this reason that the drum appears in the orchestra at the social dances of the present day.

Music has been called the universal language. This is because the emotions aroused by its various forms may be related to so many life activities. Like dancing, music may be called upon to stimulate both virtues and vices. The drooping spirits of soldiers may be incited by martial strains, and the flagging spirits of saints may be stirred by sacred airs to new deeds of devotion or self-sacrifice. So universal is the response to different forms of music that few social institutions are willing to undertake to conduct their exercises without musical parts.

The Greeks said that gymnastics strengthened the body and that music developed and refined the soul. The music of the Greeks included the recitation of poetry as well as chanting accompanied by musical instruments.

In the beginning, religion did more for the development and use of music than any other single sentiment. Later, non-religious institutions took it up, partly as a means for personal enjoyment and partly as an instrument for binding the group together in fraternal bonds. So we now have church songs, college songs, lodge songs, and many other kinds of group songs, both sacred and profane. Again, does it not seem strange that musical art should not receive more attention than it does in some schools, when we consider the extent to which it is used in the affairs of everyday life?

Dramatics. Along with dancing and music, the drama became a natural means for emotional stimulation. It was soon discovered that, aside from rhythmic movements, changes in vocal utterance aroused deep pleasurable emotions. Thus oratory, or rhetoric, had its beginning. It was easy to add to dancing facial and bodily gestures, which not only provided additional means for emotional expression on the part of the performer but also stimulated greater response on the part of the observer. Soon the performer conceived the idea of representing the emotional states of others as well as his own. This led him to assume the dress, the voice, and the gestures of the one impersonated. These steps constituted the beginnings of the development of dramatic art.

The Greeks first employed the drama in connection with their worship of the gods. A considerable part of the Greek boy's education consisted of a training in dramatics. The Romans are said to have given more than a hundred days of the year to the amphitheater, where dramatic numbers were mingled with gladiatorial contests.

Certain periods in history have been marked by an extensive use of the drama. At times religious doctrines have been promulgated through it. Sometimes the drama, like dancing, has been left in the hands of those who used it in arousing emotions of the lower order.

Since dramatics is a natural mode of expression, its æsthetic use will increase rather than diminish with the further development of the race. The delight of children in dressing and acting as adults, the use of paraphernalia by social groups, the recent development of the "little-theater movement," the attendance at all forms of dramatic exhibitions and at motion-picture houses, all proclaim an interest in the drama. Who will say that the schools have no part in determining the standards that shall govern the coming generation in selecting the types of dramatic art that it will enjoy? or who will deny to pupils the privilege of developing their dramatic talent along with other native abilities cared for in the schools?

Literature. Literature belongs in the category of fine arts along with music, with which it originated. It springs from the sources of spontaneous mental activity. In the realm of literature the unshackled imagination is free from material lines, colors, or forms. By means of word symbols it may construct worlds never realized, yet capable of yielding the greatest pleasures to those who are able to comprehend them.

While the utterance of nonmetrical sounds, or prose, undoubtedly preceded the development of verse, literature as a fine art began with poetry. Every age, from that of Homer to the present, that has aspired to culture has boasted of its literature. Every nation that has been accorded high rank by civilized people has earned its position in part because of its contribution to the world's greatest literary productions. The names of those who have embodied the highest ideals in their writings have been praised by the most enlightened of all succeeding generations. Literary masterpieces never grow old.

Because literature is able to mirror a wide sweep of sentiments, it has come to rank with music as one of man's inexhaustible sources of æsthetic enjoyment. While music is better fitted to group participation, literature furnishes to the individual a never-ending source of emotional stimulation.

Because of the availability of material and its wide appeal, literature is rapidly gaining a strong foothold in the schools.

Drawing, painting, modeling, sculpture, and architecture. Although drawing, painting, modeling, sculpture, and architecture are classed as fine arts, they bear a close relationship to the practical arts. Even though the fine arts be defined as activities that give pleasure aside from utility, certain subjects may still be classed as belonging both to the æsthetic arts and to the practical arts. In their lower forms they may be useful; in their higher forms they may possess æsthetic values. The roots of a plant may render service by supporting the stem and at the same time furnish sustenance to the bloom, which performs an æsthetic service.

Drawing may be considered as a form of language, coördinate with handwriting. Its beginnings date back to the works of prehistoric man. The teaching of drawing in the schools has been advocated for more than two thousand years.

The step from drawing to painting was a perfectly natural development. After objects were outlined, the addition of color and tone gave the appearance of life to what had formerly seemed but inanimate things. Drawing may be thought of as the necessary foundation of painting.

Modeling and sculpture originated in a desire to represent objects in three dimensions. Modeling, as the word suggests, is practiced as a preliminary step to sculpture. As in the cases of drawing and painting, modeling and sculpture are based on external objects rather than on spontaneous emotions such as furnish the foundations for dancing, music, dramatics, and literature. This should not be interpreted to mean that modeling and sculpture do not lend themselves to original design. Design is the highest form of art expression, in which drawing, painting, modeling, and sculpture are used merely as tools.

Architecture may include all branches of fine art having to do with industrial life. The development of architecture, from the unsightly shacks of the aborigines to the beautiful structures scattered throughout the world today, records the stages in man's progress from savagery to civilization.

II. FINE ARTS IN THE SCHOOLS

Teaching of the fine arts advocated by theorists. Educational writers of different centuries have advocated the teaching of the fine arts in the schools. Aristotle wanted music taught for "the rational enjoyment of leisure." He advocated the teaching of freehand drawing also.

Martin Luther and Comenius wanted music taught for religious purposes. It is said that Luther would not look with favor on a teacher who could not sing. The demand for church music led to the opening of music schools, some of which later developed into elementary schools of the literary type.

Rousseau thought that drawing should be taught to develop manual skill, Pestalozzi introduced drawing and modeling to improve sense perception and taste, and Froebel advocated handwork, physical exercises, music, and dramatics as means of self-expression. He insisted that the pictures used should be "simple and beautiful in form, color, and expression"; that words should be "clear, expressive, melodious"; that actions should be good for the "body, limbs, organs, voice" and be worthy of imitation; that ideas should be beautiful in themselves and tend to produce right actions; that music should be "simple, beautiful," and "within the child's range." Froebel was the first of the great educational theorists of modern times to outline a procedure for teaching the fine arts from a truly æsthetic standpoint.

Tardy acceptance of the fine arts in the public schools. The prevailing ideals of a people at any time tend to determine the kinds of education provided for children. Since the Puritans laid the foundations for all levels of early education in this country, the schools reflected the Puritanic ideals. In many ways these were in direct conflict with the development of the fine arts. Amusements were generally frowned upon or entirely forbidden.

Other impediments to the development of the fine arts in the schools were the social and economic conditions inherent in the development of a new country. Even after attitudes toward freedom of conduct had been liberalized by the influx of a varied population, people did not consider themselves financially able to enjoy indulgence in the fine arts, for the fine arts have usually been looked upon as luxuries. Within the memory of those now living, when it was proposed to introduce elements of either the fine arts or the practical arts into the schools they were often referred to as "fads and frills." Even today, while certain forms of the practical arts have made headway, the fine arts are still far from holding an enviable position in the schools. Dr. E. E. Brown,[1] writing about 1902, made this statement:

> Choice works of plastic and pictorial art are rapidly finding their way into our schoolrooms. There is hardly any systematic study of æsthetics in the programmes of the schools. These works are expected to accomplish their mission by their presence, supplemented sometimes by an informal discussion of their merits; or they serve to reinforce the æsthetic side of instruction in literature and in drawing. In some schools music is steadily cultivated, and holds an honored place.

As was the case with the practical arts, the fine arts are reaching the middle grades by way of both the grades below and the grades above. It may be said further that the way has been partly opened by a prior introduction of the practical arts. Mechanical drawing paved the way for freehand drawing and painting. Home economics of the purely practical type has led to an interest in house decoration, a phase of the æsthetic type. Vocal music tends to open the way for the introduction of instrumental music. The drama is slowly creeping into different subjects, such as history and language studies, as a result of a deeper appreciation of the content of these subjects. The use of better methods in the old subjects leads to a greater demand for the new subjects.

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[1] *The Making of our Middle Schools*, p. 427.

Lowell Mason, sometimes called the father of school music in America, is credited with causing vocal music to be introduced into the Boston public schools in 1837. Brown states that the first school law of California, passed in 1851, required music to be taught in the high schools.

The introduction of the kindergarten into American schools about 1860 gave impetus to the development of singing, drawing, modeling, and simple dramatics in the primary grades. Although the fine arts in the middle grades are still poorly developed, there is reason to hope that influences coming up from the primary grades will join with influences coming down from the high schools to formulate suitable courses for that period in the lives of boys and girls when they are in need of, and susceptible to, the refining influences of the æsthetic arts.

III. SUBJECT MATERIALS IN THE FINE ARTS

Types of pupils and subject matter in music. In no other field of human capabilities are greater individual differences to be found than those encountered in music. How does a Caruso differ from a person unable to carry a simple tune? Again, what are the differences between a Caruso, a great vocalist, and a Paderewski, a great instrumentalist? When the Committee on Music in Secondary Education, in *Bulletin No. 49* (1917) of the Bureau of Education, recommended that three types of courses in music be given to meet the needs of three groups of pupils in the schools, it did not intend to argue that all pupils may be placed in one of three categories. Indeed, the groups overlap in many ways.

The three groups suggested by the committee are (1) the little interested and the nonmusical, (2) the interested but little talented, and (3) the talented. Here we have suggested the two basic causes of musical differences in individuals: physical endowment and emotional attitude. For instance, the organs of voice are so complex that few are endowed with sufficiently well-developed and well-coördinated vocal equipment to become great vocalists; and where the organs are good the proper mental or emotional conditions may be lacking. As a result of variations in these two factors, pupils of all grades of musical talent appear in the schools.

The first task of the school should be to make a thorough diagnosis of the musical interests and abilities of all pupils as soon as possible. While the school may not be able to develop all the musical talent available, it can perform two distinct services for the community. While declining to waste funds on the advanced technical training of the untalented, it may communicate to parents the discovery of talent, and it may develop the capacities of all pupils for the appreciation of good music.

While musical instruction will not be restricted to particular grades of the school system, the period covered by the middle grades is of unusual importance. Change of voice occurs about the time of the pubic change, when the emotions are greatly stirred. The development of sex and of the social impulses contributes to an appreciation of music. Musical talent should be well started on the way to development by the time the child is fifteen years of age.

The committee cited above recommends the following outline of work for the three types of pupils named:

> For the first type, or those little interested or nonmusical: chorus singing, hearing music presented by others, elective chorus classes and glee clubs, and some discussion of music appreciation.
>
> For the second type, or those who are interested but who do not wish to study music exhaustively: chorus singing, music appreciation, theory of music, and glee clubs — all to be elective.
>
> For the third group, or those talented: chorus singing, orchestra, glee clubs, music appreciation, theory of music, and applied music (vocal or instrumental) — all to be elective. The last three types of courses are suggested mainly for pupils in the senior high school.

The distribution of the work through the grades will depend to a great extent upon local conditions. The number of choruses, the types of instruments used, the amount of rote or note singing, the supply of competent instruction, and general musical interest in the community will be variable factors.

Chorus singing is well suited to all the school years. In the kindergarten and primary grades rote work will prevail, although note work should be begun. In the fourth, fifth, and sixth grades, chorus work for all should be continued; but for a considerable number of pupils note work should be stressed. Those who are to become the musical leaders of the community should be able to read simple music with some facility by the time they finish the sixth grade. Pupils in these grades should be permitted to hear as much good music as possible.

It is in the seventh, eighth, and ninth grades that the future musical interests and abilities of pupils will usually be determined. In large schools several choruses should be organized in which different types of work may be given. Although orchestral music will usually be taken up in the fifth and sixth grades, sometimes even as early as the fourth, it should now be stressed in the upper middle grades for those especially interested. As much good music by experts as possible should be provided for the entire school. Leaders in musical education point out that instruction in music appreciation should receive attention in all grades of the elementary schools. Indeed, some hold that this is of more importance than the choral singing usually stressed in all modern schools. Excellent suggestions for teaching music appreciation may be obtained from such books as *Music Appreciation in the Schoolroom*[1] and *Listening Lessons in Music.*[2]

The music materials provided for the middle grades should be chosen primarily with reference to the welfare of all and not for the training of a few gifted pupils. The largest possible development of musical interest and enjoyment, participation by the many rather than by the few, and the discovery of superior talent for future development should be the prevailing aims. If musical interests are aroused, if some command of the simple elements of technique are attained, and if a genuine interest in the enjoyment of good music is developed, the higher forms of technical training in different musical lines may be left to the years beyond the middle grades.

Dramatics in the schools. By means of dramatic art, from simple pantomime through all the forms of comedy and tragedy up to grand opera, we find portrayed many of the deepest emotions of the soul. Whether it be a desire to ridicule, merely to impart information, or to arouse the strongest passions, a good dramatic presentation seldom fails to bring results.

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[1] T. P. Giddings, Will Earhart, R. L. Baldwin, and E. W. Newton, *Music Appreciation in the Schoolroom.* Ginn and Company, 1926.

[2] Agnes Fryberger, *Listening Lessons in Music.* Silver, Burdett & Company, 1916.

That actions speak louder than words may be accepted as a true dictum; but when words and actions both are used, the impressions may be made doubly vivid. When words are set to music and then accompanied by suitable gestures, the highest pleasure derived from dramatic art is experienced.

As previously stated, gesture was one of the earliest means for the communication of thought. Animals as well as men use it almost continuously. Love, anger, sympathy, feelings of elation and subjection, and other emotions connected with mental processes are usually made known by different forms of dramatic expression. Birds coo and strut in love-making; beasts growl and raise the hair or otherwise change the form of the body in fits of anger. From the antics of the clown in the circus to the performance of the prima donna in grand opera, the object is to arouse emotions., As men rise in the scale of civilization, dramatic representation becomes more and more æsthetic.

Since dramatic representation has played such a part in the social development of the race, and since the pageant, the stage, and the moving pictures are sources of pleasure for millions of people today, the question may be asked as to why dramatics is given so little attention in the schools.

After all, dramatics is merely a tool subject. It is only a form for the presentation of the content of other materials. Although in its highest development it appears in connection with music, it is most frequently used in the schools as a means for portraying the content of literature. Great opportunities for its use may be found also in connection with the study of the social subjects, the sciences, home economics, music, and other subject materials.

Since dramatics may be used in various subjects and on all school levels, it is not deemed necessary to undertake to outline work for the different grades. Its own specific content will consist in control of the voice, command of gesture, selection of equipment, and in the proper costuming and staging of performances. For these ends certain technical instruction will be required. For this instruction teachers trained in dramatics will be necessary. So far this work has been left to the chance interest of some instructor who was willing to assume the responsibility for teaching dramatics in addition to a regular teaching load in other subjects. In some schools auditorium work is made a part of the required work, in which case a more adequate type of instruction is usually provided.

For those interested in dramatics many opportunities will be presented for its exercise. In addition to the regular school work such activities as home entertainments, holiday festivals, church activities, amateur theatricals, and social clubs will furnish many opportunities for the development of dramatic talent.

Literature in the schools. The production of literature, both prose and poetry, must be classed as one of the highest of the fine arts. Of late there are signs that literature may be rescued from the position of a mere chopping-block for the study of forms and raised to that high service of inspiration and enjoyment for which it has always been intended by its producers. The signs suggested may be found in the use now made of reading materials in some schools. Reading for understanding and appreciation, writing from experience or imagination, opening libraries to the free choice of growing children, and surrounding boys and girls in the homes with reading materials suited to their stages of mental development are some of the movements that will contribute much to the pupil's æsthetic enjoyment of literature.

Since the selection of literature will vary with individuals, schools, and communities, it does not seem practicable to attempt to outline the materials that should be used in the several grades. Many such outlines are easily available.

Suffice it to say that if pupils do not become interested in the enjoyment of good literature while they are passing through the middle grades, many will leave the schools without becoming acquainted with one of the most available means for personal and social æsthetic enjoyment.

Interpretative dancing. Interpretative dancing is merely one phase of dramatics. Its purpose is to express certain ideas or emotional states by means of rhythmic movements. The interpretative dancer is not always an empty-headed individual as is sometimes supposed. In the first place, complete control of limb and body movements must be obtained; next, a theme must be developed in the mind; and, finally, the composition must be portrayed in graceful form. Aside from the æsthetic values of interpretative dancing, strength and efficiency in bodily organs may be developed.

Interpretative dancing is now found in the kindergarten and in the college. Some attempt has been made, also, to introduce folk dances into the elementary schools.

In recent years progress has been made in caring for the bodies of children in the schools. Playgrounds, gymnasiums, and cafeterias have been installed. Plays and games have been introduced. Some good gymnasium work may be found in the schools. As a motivating force, athletics is in the ascendancy. In the opinion of many there is a need for physical exercises that will be more personal, more graceful, and more æsthetic. Interpretative dancing is proposed as one means for meeting this need.

Drawing, coloring, and design. While the chief aim in teaching the fine arts in the elementary grades is to develop appreciation rather than to perfect pupils in technical skill, experience has demonstrated that this purpose may be best realized through the learner's participation in different phases of work in the arts.

Young children seem to draw naturally as a means of self-expression. They do not draw from external objects at first. Their pleasure arises from the spontaneous exercise of their own minds and fingers. This disposition to draw or to picture without the aid of external objects lies at the foundation of design. It cannot be claimed that young pupils manifest much æsthetic interest in their drawings. Freedom of imagination and liberty in expression mark the child's first adventures in the fields of graphic art. They may delight in crude figures or in gaudy colors, but their freedom should not be too much abridged. These facts should be observed in selecting subject materials for the lower grades.

Experienced teachers of art generally agree that by the time pupils reach the fourth grade they become more critical of their own work. They begin to manifest real appreciation of æsthetic relationships. Instruction in art should then begin in earnest. Unless the eye is trained to discriminate and the hand to execute with interest and appreciation in the pre-adolescent and early adolescent years, when great mental and physical changes are taking place, later developments in drawing, painting, and designing will be greatly handicapped.

The distribution of exercises through the grades will vary with classes of pupils, teachers, and schools, but the tools and general phases of work will be the same. The basic elements will always be lines, tones, and colors; the tools will consist of pencils, pens, crayons, crayolas, brushes, colors, blackboards, papers, knives, scissors, blotters, and erasers; the technical activities will include drawing, coloring, illustrating, designing, and mounting.

Art work may be roughly divided into three types: copying, illustrating, and designing. These types call forth different kinds of abilities. Many pupils can make faithful copies of objects or pictures but are unable to design new ones. Illustration is more nearly related to design than to copying, since the illustrator must translate ideas into pictures. This requires imagination and originality. The highest type of artistic ability, which few pupils possess, is required in design.

Design is the most important phase of art work, and should be started as early as possible, but not much progress will be made before pupils reach the middle grades. In the first three grades the work will consist of exercises in lines and colors applied to simple objects. The proper handling of art tools should receive attention. Pupils will be especially interested in coloring. For this work, outlines may be furnished or prepared and brushes with water colors may be used. Freedom should be allowed, and not too much should be undertaken.

More serious instruction should begin with the fourth grade. The study of colors will be continued, with crayon as the medium of expression. Copying, illustrating, and designing should all receive attention. Picture study already begun in the elementary grades should be continued. Blackboard work should be included. Zest will be added to the work if some definite purpose is placed before the pupils. The preparation of some piece to be used in connection with other subjects, in some entertainment, or as a gift will greatly stimulate the work. While objects such as grass, leaves, trees, and the like must be copied, there is a danger of holding pupils on the same type of exercise too long. Children become impatient and lose interest when too much is expected of them.

If good art courses are provided in the elementary grades, by the time pupils reach the junior high school their interests in art work should be pretty well developed. Two types of courses should be offered. Some pupils will be able to profit more from exercises in copying and mechanical drawing; others will turn to colors, illustration, and design. The main purpose should be to arouse appreciative interest in the beautiful in nature, in pictures, and in all sorts of objects constructed by man.

The subject matter for the seventh, eighth, and ninth grades should comprise color scales, color schemes, and color harmony. Pupils should study objects, figures, and books, and apply the principles learned to new constructions. The patterns for expression will be provided by lettering, posters, color schemes for house decoration, simple costumes, and the crafts. Picture study should be continued. Some discussion of the elements of art appreciation may be introduced in the eighth and ninth grades for those pupils who show ability and who have made real progress in art work. Instruction in technique should, of course, be suited to the advancement of the pupils.

Modeling and sculpture in the schools. So far, modeling and sculpture as fine arts have not gained a secure foothold in the schools. The reasons for this seem to be fairly obvious. In the first place these arts are closely related to the practical arts. Until certain advancement is made in knowledge of the practical arts, the æsthetic features are not likely to appear. It is fairly safe to say that such modeling or sculpture as has been attempted in the schools has related more to the practical than to the æsthetic side.

The materials used in modeling will usually consist of paper, sand, clay, wax, cement, wood, reed, or metal. The first four of these will be best suited to the work of primary pupils. Clay, wax, and wood may be used by children in the fourth, fifth, and sixth grades, and cement, wood, and metals may be introduced in the grades above.

In the lower grades the best results in modeling and sculpture will be secured when these are combined with drawing and coloring. In the middle grades they may be joined with the practical arts. This should not be construed to mean that the æsthetic side should be neglected. The development of the practical side will serve as a basis for the pleasure or appreciation side. The boy who constructs a useful piece of woodwork from drawings or models may finally come to enjoy the contemplation of its lines and form. The girl, by means of drawings, patterns, and models, may plan and make a dress that will arouse emotions of satisfaction because of the suitability of its lines to her own figure.

IV. METHODS IN THE FINE ARTS

General methods. In teaching the fine arts in modern times two general procedures have been developed. One of these may be described as imitative, the other as creative. The first, the imitative method, came to us as a result of the Renaissance. Naturally, in the great revival of learning, the fine arts of the great classic nations of antiquity would attract attention. The products of the ancients became models for study and imitation. This gave rise to a type of teaching that has persisted until the present time.

The second type of teaching, which came later and may be designated the creative procedure, would have the pupil begin with natural objects. Rousseau, one of the first advocates of this method, proposed that in teaching drawing there should be no master other than nature and no models but objects.

Pestalozzi thought that by the imitation of good models sentiments would be developed and standards improved. Instead of beginning with the creative side of child nature, Pestalozzi began with reproduction.

Froebel conceived the mind to be an organism awaiting unfoldment from within. This led him to formulate his well-known principles of self-activity, self-development, and self-expression. Here we find the foundation for what is known as the constructive approach for teaching the fine arts. Froebel also gave precedence to the fine arts in selecting singing, dancing, dramatics, modeling, and construction as his chief subject materials. Much of the time was spent by his pupils in observing natural objects in the gardens or in constructing objects of their own design. Pestalozzi may be said to have taught by observation and imitation, whereas Froebel used observation and design.

Methods suited to different types of pupils. Few pupils possess a high grade of productive ability in the fine arts; still fewer will ever be led to make contributions to the world's stock of æsthetic masterpieces. This does not mean that because the number of producers may be small the number of consumers will be limited. While the few may become producers, the many may become consumers.

In the development of producers and consumers both the teaching procedures discussed under the last topic will be necessary. There should be observation and imitation as well as observation and self-expression. For the great majority of pupils these two procedures will go hand in hand. From the original disposition of children to express themselves a few pupils may pass on to spend the greater part of their time in production, but the majority will profit more from both reproduction and production. The relative numbers of producers and consumers may be estimated by comparing those who are able to join in choral singing to a limited extent and those who will ever be able to write the words or music of a worthy song. Again, the number that may be able to use simple drawings in connection with the study of different subjects, such as geography, science, or household arts, will greatly exceed those who will ever use drawing in advanced design. Methods for the preparation of the consumer class are of first importance in the middle grades.

Natural methods in the fine arts. In Chapter IV may be found a discussion of different general methods of teaching. The procedures enumerated are self-instruction, demonstration, oral communication, the use of recorded materials such as pictures, books, etc., the use of objects, and the employment of problems and projects. An examination of the materials used in the fine arts reveals the fact that every one of the methods named may be employed in teaching them.

When the child is learning to draw he prefers at first to be let alone. Later he will observe the teacher or a classmate. As time passes he will turn to objects, pictures, or books. Finally, he may prepare an original production. All these procedures in learning and teaching may be employed in a single lesson. These same principles are almost equally applicable to the teaching of vocal and instrumental music, painting and designing, modeling and simple construction, literary appreciation and dramatics — the different forms of the fine arts recommended for the middle grades.

Motivation in teaching the fine arts. The greatest reason why the drawing formerly taught in the schools failed to interest pupils was that it led nowhere. It was made an end in itself. As soon as the pupil was permitted to draw something with a purpose he became interested.

The fine arts are based on a desire for pleasure. Unless some pleasure is forthcoming, children will tire of the work. Members of the choral club will work harder at the preparation of a number to be sung before the entire school than they will on a formal exercise. Interest in the exercise will be increased if it can be tied in with the preparation of a song. Work in drawing, coloring, designing, modeling, or construction that is to be exhibited at the school fair will be done with greater enthusiasm than tasks assigned without a purposeful end in view. The teacher should see that the pupils have something more than a "fizzle" to make. Work in the fine arts should be more easily motivated than lessons in the so-called academic subjects. Music, pictures, dramatics, and the other products of the æsthetic arts are in demand almost everywhere. Teachers of the fine arts should be ever on the alert for occasions that will stimulate the pupils to prepare products worthy of presentation to suitable audiences.

V. UNITS OF WORK IN THE FINE ARTS

Project for the Fifth Grade

Aims. To develop in pupils the ability to select a project in design, drawing, and coloring, to prepare the materials, and to execute the steps required for its completion.

Project. To make a Christmas card.

Procedure. 1. Pupils may be requested to bring to school any simple designs of Christmas cards that they may have at home. These, with others, may be examined with reference to size, background, decoration, coloring, greeting, lettering, and so on.

2. After the cards are put away, the class, under the guidance of the teacher, may design a card. For this the blackboard can be used. Individual pupils may then work out in lines, colors, and letters the general design agreed upon. This may be done with cardboard, pencils, and colors. Instruction to individual pupils should be given as needed.

3. When the trial cards are completed, the best ones may be displayed for the benefit of the class. Discussion of the work should follow, in which pupils should be encouraged to lead.

4. After the completion of the trial card, pupils should be allowed to take up the designing and preparation of individual cards. Simple designs should be encouraged. The project can be completed by exchange or other use of the cards produced.

While the making of Christmas cards in the Christmas month will make a strong appeal, Thanksgiving cards, valentines, commencement invitations, and the like may be used with almost equal effect to motivate certain phases of art work.

Projects in Music, Interpretative Dancing, and Dramatics for any Middle Grade

The teachers of music, of interpretative dancing, and of dramatics will usually have had special training in their several lines and will be able to set up their own projects, but a few observations may be made with regard to the general organization and motivation of the work.

Since the aim should be to develop each pupil in his own line as rapidly as possible, the grouping of pupils will be a difficult task. The chief difficulties will arise from individual differences in native abilities, from the special training that some children receive out of school, and from the varying degrees of interest that pupils have in the work. Because of these conditions, provision should be made for stimulating the best work of which each pupil is capable. This may be done by selecting from the different grades those who can profit by more rapid advancement than the others, or the more capable members of each group may be given the more responsible parts.

While the project for a group in vocal music may consist in learning a song to be rendered before the school, while the class in interpretative dancing may select a project to be presented at the May Day exercises, and while the dramatic club may render a one-act play at a meeting of the parent-teachers' association, a combination project that will involve all these groups may arouse the highest enthusiasm, not only among the producers but among the consumers as well. For such projects the adaptations of certain simple dramas and light operas may be used.

Project for the Ninth Grade

Project. To arrange and enjoy the decorations of a classroom.

Procedure. 1. The project may be presented through a discussion of the differences between house-furnishing as a practical art and house-decoration as a fine art.

2. In order to carry on the work in a systematic way, pupils may be allowed to make lists of the different features that they would include in the decoration of a room. When the lists are assembled the following items will probably appear: furniture, color scheme, pictures, curtains, statuary, and flowers.

3. If the furniture is already provided, the color scheme for the entire room may be considered. Rooms may be visited, pictures may be examined, and references may be consulted in determining the colors to be used. The best arrangement of furniture may then be agreed upon.

4. The selection of curtains will provide an opportunity for a study of kinds of materials, their costs and their durability, and methods of hanging. While some of these factors are more economic than æsthetic, they contribute to a realization of the pleasure element.

5. The selection of pictures will require discussion of locations, colors, tones, suitability, and costs. Suitable pictures for different kinds of rooms in the home and in public places may be discussed.

6. The relative advantages of using window boxes or pedestal containers for flowers may be studied, and the question whether it will be better to use foliage plants or flowering plants may be settled after investigations have been made.

7. The completion of the project will require the actual furnishing or refurnishing of the room. This may or may not be possible, but at any rate the study should prepare pupils for a more artistic arrangement of the furnishings in their homes.

VI. CHAPTER SUMMARY

The fine arts may be divided into two groups. Dancing, music, literature, and dramatics seem to depend more upon the spontaneous emotions; modeling, sculpture, painting, and architecture have more to do with changing natural objects.

Dancing, one of the oldest of the various forms of physical exercise, has served to stimulate many types of emotions. Civilized and uncivilized peoples have used it both to arouse religious fervor and to stir the baser passions. In spite of much opposition it continues to be a source of pleasure for an increasing number of people.

Music was first developed to furnish a rhythm for dancing. It has been called the universal language because of its appeal to people of every age and every clime. Although it plays a major part in the æsthetic pleasures of the world, it occupies a minor position in the formal education of the young today.

The drama has been used by the most civilized nations of the world to stir the emotions and to promulgate doctrines. Although the drama may be used in many ways, it renders the highest service as a fine art in connection with music and literature. It combines the uses of dress, gesture, and voice. Because of its appeal to so many senses, it is a powerful means for arousing the emotions. It is often maintained that so valuable an art should receive more attention in the schools.

Literature as a fine art ranks with music, with which, in its poetic form, it is often associated. Since it expresses ideals, it is used as a standard by which to judge the progress of nations.

Drawing, painting, modeling, sculpture, and architecture, although classed with the fine arts, sustain a close relationship to the practical arts. Drawing may be considered as a form of language coördinate with handwriting. Painting consists in the addition of colors to drawings, modeling and sculpture enable the artist to represent objects in three dimensions, and architecture may include all the phases of art named above.

As in the case of other subjects, the teaching of the fine arts in the schools was advocated by educational theorists long before it was introduced. Aristotle, Luther, Comenius, Pestalozzi, and Froebel all desired certain of the fine arts to be taught in the schools, but these men did not present the same reasons or propose the same methods. To Froebel must be given the credit for accentuating the purely æsthetic necessity for teaching the fine arts.

The fine arts were late in coming into the schools of this country, first, because the early church opposed indulgence in so-called worldly pleasures. In the second place, they have been looked upon as luxuries which should be provided only after material interests have been fully satisfied. Except for the elements of drawing and music, little progress was made in teaching the fine arts in the schools until the present century.

The Committee on Music in the Secondary Schools proposed in 1917 that three types of work in music be provided for as many types of pupils: (1) the little interested and the nonmusical, (2) the interested but little talented, and (3) the talented. For the first type, chorus singing, choral and glee clubs, and the discriminative listening to good music are recommended; for the second type, music appreciation and some theory of music are added to the work suggested for the first group; for the third group, applied music is added to the work outlined for the other two groups. It is generally agreed that the music courses for the lower and middle grades should be for the many who will enjoy music rather than for the few who will produce it.

Dramatics have played a large part in the development of the race. Whether the purpose be to communicate thought, to provide amusement, or to arouse emotion, dramatization well done seldom fails to bring the desired results. There are some indications that dramatics will receive more attention from the schools in the future than they have in the past.

Of all the fine arts, literature has gained greatest recognition in the schools. Although it has not always been studied with emphasis on the æsthetic side, there are indications that it is now being treated more and more as a fine art.

Interpretative dancing, a phase of dramatics, is now found in the kindergarten and in the colleges. Folk dances are being used in some schools. While good work in physical exercises may be found in the best schools, there is yet need of exercises that will add ease, grace, and beauty to bodily movements. Interpretative dancing is proposed as one means to this end.

Children in the elementary grades draw and color as a matter of self-expression. They seem to manifest little æsthetic interest in what they draw. By the time they reach the middle grades they become critical of their own work. Art instruction should then be stressed. The subject matter will vary with classes, schools, and communities.

Art work may be divided into copying, illustrating, and designing. Of these, design is the most important, although few pupils will ever be able to design well. The chief purpose of art work in the middle grades is to discover talent and to develop appreciation of the beautiful in nature and in man's products.

Modeling and sculpture may be taught best in the middle grades in connection with the practical arts. The æsthetic emotions will be aroused when the lines and parts of objects are seen to harmonize with one another or with those of other objects. A dress may be beautiful on one person but not on another. Dressmaking may be merely a practical art, or it may be raised to a fine art when beauty is added to utility.

Two general methods of procedure have been used in teaching the fine arts. These are known as the imitative type and the creative type. The imitative type came as a result of the Renaissance; the creative type is founded upon the idea of self-expression. The former takes its models from the works of artists of reputation, the latter from nature.

Methods in the fine arts will vary according to the purposes of the work. Pupils may be divided into two groups, the producers and the consumers. Methods in the middle grades should be largely directed to preparation of the consumer class. For the producers design will be stressed; for the consumers design will play a less important part, and more time may be spent on reproductive work.

Natural methods of instruction include self-instruction, oral communication, the use of recorded materials, and the use of natural objects, all of which may be used in teaching the fine arts.

Since the fine arts make a varied appeal to a great number of people, many opportunities are afforded for motivating class work. When pupils know that their products will be judged by real audiences, greater interest and effort will be aroused in the work. For this reason teachers should be on the alert for opportunities to display the work of their pupils before suitable audiences or spectators.

EXERCISES

1. Make a list of organizations that have influenced the development of the æsthetic arts in the United States.

2. Enumerate the steps that led to the introduction of the fine arts into the public schools.

3. How do you account for the fact that until recently the æsthetic arts received so little attention in the schools?

4. Make a study of the causes that led the Puritan church to oppose the theater.

5. What effect have the moving pictures had on the æsthetic arts?

6. Enumerate ways in which the school auditorium may be used to motivate work in the æsthetic arts.

7. Make a list of natural impulses in children from nine to fifteen years old that may be used in teaching different phases of the fine arts.

8. Suggest five magazines that may be used in teaching the arts.

9. Select lists of textbooks that may be used in teaching the æsthetic arts.

10. Review the basic methods of teaching discussed in Chapter IV of this book and show how they may be used in teaching different phases of the fine arts.

11. Suggest five projects, each of which will require the employment of three different phases of the æsthetic arts for its completion.

12. Outline the subject matter and the procedure for the development of one of the projects suggested in Exercise 11.

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